





Course Title: Advanced Database Management Systems

Course Code: IS 611

Program: Masters in Computer Information Systems

Department: Department of Information Systems

College: College of Computer Science and Information Technology

Institution: King Faisal University

Version: 1.0

Last Revision Date: 15 October 2023





2024

PG-153



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A. General information about the course:

1. Course Identification:

1 Credit hours (3)

2. C	ourse type				
Α.	□University	□College	🛛 Department	□Track	
В.	\boxtimes Required		□Elect	ive	
3. Level/year at which this course is offered: (1)					
4. Course general Description:					

This course covers advanced topics in the design and management of database systems including storage and primary file organizations, index structures and access methods for files, directory management, query processing, query optimization, transaction processing, nested transactions, concurrency control techniques, deadlock management, fragmentation and its control, integrity constraints, database recovery, distributed databases, object and object-relational databases, deductivedatabases and data integration in multi-databases. The primary focus of this course is to provide students with insights on the internal working of a database management system as well as draw attention to advanced topics in database.

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

None

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

None

7. Course Main Objective(s):

The course objectives are as follows:

- Develop insights to the issues and challenges involved in database design and management
- Develop insights into the internal working of modern Database Management Systems
- Identify and apply efficient storage and retrieval techniques to manage massive databases
- Identify and apply advanced concepts and techniques in performance tuning, recovery and database security
- Recognize and review alternative or innovative solutions to the emerging issues and challenges in data management.

2. Teaching Mode: (mark all that apply)





No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom		
2	E-learning		
3	HybridTraditional classroomE-learning	45	60 – E-Learning 40 – Traditional
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 CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Develop insights to the issues and challenges involved in database design and management	К1	Lecture, Project	Assignment Quiz Exams
1.2	Develop insights into the internal working of modern Database Management Systems	К1	Lecture, Project	Assignment Quiz Exams
2.0	Skills			





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Identify and apply efficient storage and retrieval techniques to manage massive databases	S2	Lecture, Project	Assignment Quiz Exams
2.2	Identify and apply advanced concepts and techniques in performance tuning, recovery and database security	S4	Lecture, Project	Assignment Quiz Exams
3.0	Values, autonomy, and responsibility			
3.1	Recognize and review alternative or innovative solutions to the emerging issues and challenges in data management	V1, S6	Lecture Group project	Exams Project evaluation

C. Course Content:

No	List of Topics	Contact Hours
1.	Introduction and overview of Database and DBMS including various Data Models (Relational, Object-oriented, XML, Graph, etc.)	3
2.	Overview of Reliable Data Storage and Efficient Data Access (disk and file organization basics, Hashing and Indexing)	6
3.	Query Processing and Optimization	6
4.	Transaction Management including Concurrency and Deadlock	6
5.	Midterm Examination, Project Meeting	3
6.	Crash Recovery and Backup	3
7.	Physical Database Design and Performance Tuning	3
8.	Security and Authorization	3
9.	Parallel and Distributed Databases	3
10.	Advanced Topics (e.g., Deductive Database, Data Mining, Data Warehousing, Information Retrieval)	6
11.	Project Presentation and Demo	3
12.	Final Examination	3
	Total	45





No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz-1	4	2.5
2.	Quiz-2	6	2.5
3.	Quiz-3	10	2.5
4.	Quiz-4	14	2.5
5.	Project	Last Week	25
6.	Mid Semester Exam	8	25
7.	Final Exam	17	40

D. Students Assessment Activities:

*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	Avi Silberschatz, Henry Korth, and S. Sudarshan, DatabaseSystem Concepts", 7 th Edition, McGraw-Hill
Supportive References	 Elmasri, Ramez. Navathe, Shamkant B., Fundamentals of DatabaseSystems, Addison-Wesley, 6th Edition, 2010. Carlos Coronel, Steven Morris and Peter Rob, "Database Systems: Design, Implementation, and Management", 9th Edition, Course Technology, 2009. ISBN: 0538469684. David M. Kroenke and David Auer, "Database Processing", 11th Edition ornewer, Prentice Hall, 2009. ISBN: 0132302675
Electronic Materials	
Other Learning Materials	

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	A classroom in which both male and female students can attend the lecture simultaneously and has enough seating capacity is needed.
Technology equipment (Projector, smart board, software)	A data show that is visible to both male and female students is needed.
Other equipment (Depending on the nature of the specialty)	Internet-enabled Computer





F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, Faculty, Program Leaders, Peer Reviewer	Direct
Effectiveness of students assessment	Faculty, Peer Reviewer	Direct
Quality of learning resources	Students, Faculty, Program Leaders	Direct
The extent to which CLOs have been achieved	Faculty, Program Leaders, Peer Reviewer	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify) Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

