Science & IT
Faculty of Science & IT

جامعــة الزيتونـــة الأردنيـــة
Al-Zaytoonah University of Jordan
كلية العلوم وتكنولوجيا المعلومات
Faculty of Science and IT

جودة- وجودة
"Tradition and Quality"

QF01/0408-4.0E	Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Department

Study plan No.	2021/2022	University Specialization	Software Engineering
Course No.	0114442	Course name	Database management System
Credit Hours	3	Prerequisite Co-requisite	Database

Course type	☐ MANDATORY UNIVERSITY REQUIREMENT	☐ UNIVERSITY ELECTIVE REQUIREMENTS	☐ FACULTY MANDATORY REQUIREMENT	✓ Support course family requirements	Mandatory requirements	☐ Elective requirements
Teaching style	☐ Full online learning		☐ Blended learning		√ Traditional learning	
Teaching model	☐ 2Synchronous: 1asynchronous		☐ 2 face to face : 1synchronous		3 Traditional	

Faculty member and study divisions' information (to be filled in each semester by the subject instructor)

Name	Academic rank	Office No.	Phone No.	E-mail
Dr.Feras Ahmed Altarawneh	Assistant professor	117	325	f.altarawneh@zuj.edu.jo

Division number	Time	Place	Number of students	Teaching style	Approved model

Brief description

The aim of the course is to introduce students to current techniques, methods and results from the active field of database systems and data management. Typical topics include query planning and optimization; transaction processing and concurrency control; database Security and Distribution; Advanced Database Models, data mining, data warehousing; File Structures, and Indexing and Hashing.

Learning resources

Course book information (Title, author, date of issue, publisher ... etc)	1. Fundamentals of Database System, Elmasri Ramez and Navathe Shamkant, Pearson India; 7th edition (March 17, 2017)
Supportive learning resources (Books, databases, periodicals, software, applications, others)	1. Database Systems: Design, Implementation, & Management, Carlos Coronel, Steven Morris, 2018, 13th Edition, ISBN-10: 1337627909 2. David M. Kroenke , David J. Auer "Database Concepts" (7th Edition) ISBN-10: 0133544621 (2014) 3. Database Systems design, Implementation and Management (12th Edition) by Carlos Coronel, Steven Morris, Publisher: Cengage Learning, (2016)
Supporting websites	
The physical environment for teaching	☐ Class room ✓ labs ☐ Virtual educational platform ☐ Others
Necessary equipment and software	**MySQL software**

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Supporting people with special needs	**Lab supervisors with experience in SQL programming**
For technical support	

Course learning outcomes (S = *Skills, C= Competences K= Knowledge,*)

No.	Course learning outcomes	The associated program learning output code
Knowledge		
K1	The knowledge of the transaction processing concept, theories, and concurrency control mechanisms in the database system management.	MK3
K2	awareness of the algorithms used for query processing and optimization	MK4
K3	Understanding of the database indexing structures for database files	Mk4
K4	Understanding the data mining and data warehouse: concepts and implementation	Mk4
Skills		
S1	An ability to apply the suitable concurrency control mechanisms for handling different concurrency problems.	MS2, MS3
S2	An ability to use the SQL programming language to apply different algorithms in query processing and optimization	MS2, MS3
S3	An ability to use the SQL programming language to create the appropriate index file for different database files.	MS2, MS3
S4	An ability to compare, analysis and evaluate methods/technologies in developing data warehouses & data mining	MS1
Competences		
C1	An ability to develop optimizing queries, and indexing files for the database systems in diverse application domains.	MC2
C2	An ability to work with diverse team and communicate effectively	MC1
C3	An ability to learn from, and get expertise from different domains.	MC3
C4		

Mechanisms for direct evaluation of learning outcomes

Type of assessment / learning style	Fully electronic learning	Blended learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
Midterm exam	30%	30%	**40%**	30%
Participation / practical applications	0	0	**10%**	30%
Asynchronous interactive activities	30%	30%	**0**	0
Final exam	40%	40%	**50%**	40%

Note: Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, work within student groups ... etc, which the student carries out on his own, through the virtual platform without a direct encounter with the subject teacher.

Schedule of simultaneous / face-to-face encounters and their topics

Week	Subject	learning style*	Reference **
1	**Chapter 20 : Introduction to Transaction Processing Concepts and Theory** • Introduction to transaction processing • Transaction and system processing • Desirable properties of transactions	**Lecture**	776-805
2	• Characterizing schedules based on recoverability • Characterizing schedules based on serializability	**Lecture**	
3	**Chapter 21 : Concurrency Control Techniques** • Two-phase locking techniques concurrency control	**Lecture**	812-827
4	• Concurrency control based on Timestamp ordering	**Lecture**	
5	• Multi-version concurrency control techniques Using locks for concurrency control in indexes	**Lecture**	835-836
6	**Chapter 17: Indexing Structures for Files and Physical Database Design** • Types of Single- level ordered indexes	**Lecture**	632-660
7	• Multilevel indexes • Dynamic Multilevel indexes using B-tree	**Lecture**	
8	**Chapter 28: Data Mining Concepts** • Overview of data mining technology • Association rules • Classification • Clustering	**Lecture**	1100-1120

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9	**Chapter 29: Data Warehousing. Some important Concepts and OLAP** • Introduction, definition and terminology • Characteristics of data warehouses • Data modeling for data warehouses	**Lecture**	1132-1140
10	**Chapter 22 : Database Recovery Techniques** • Recovery concepts NO-UNDO/REDO Recovery based on Deferred update	**Lecture**	844-855 861-862
11	• Recovery techniques based on immediate update • Recovery in Multi-database systems	**Lecture**	
12	**Chapter 16 : Disk Storage, Basic File Structures, and Hashing and Modern Storage Architectures** • Introduction • Secondary storage device	**Lecture**	572-585 602-611 618-621
13	• Hashing techniques • Modern storage architectures	**Lecture**	395 - 437
14	**Chapter 19: Query Optimization** • Query trees and heuristics for query optimization • Choice of query execution plans	**Lecture**	722-743 761-768
15	• Using selectivities in cost-based optimization • An example of query optimization in data warehouses • Overview of query optimization in Oracle	**Lecture**	
16	**Final Exam**		

* **Learning styles: Lecture, flipped learning, learning through projects, learning through problem solving, participatory learning ... etc.**

** **Reference: Pages in a book, database, recorded lecture, content on the e-learning platform, video, website ... etc.**

Schedule of asynchronous interactive activities (in the case of e-learning and blended learning)

Week	Task / activity	Reference	Expected results
1			
2			
3			
4			

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5			
6			