جامعة الزيتونة الأردنية
**Al-Zaytoonah University of Jordan**
كلية العلوم وتكنولوجيا المعلومات
**Faculty of Science and IT**

تراث- وجودة
"Tradition and Quality"

| QF01/0408-4.0E | Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Department |
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| Study plan No. | 2021/2022 | University Specialization | Software Engineering |
|---|---|---|---|
| Course No. | 0114341 | Course name | Database |
| Credit Hours | 3 | Prerequisite Co-requisite | Data Structure and Algorithms |

| 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 |
|---|---|---|---|---|---|
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## Brief description

In this course, the students should learn about the database design methodology that is explicitly divided into three phases: conceptual, logical, and physical. This course focuses on an introduction to database systems design implementation and management issues, as well as an extensive treatment of database languages and standards.

## Learning resources

| Course book information (Title, author, date of issue, publisher ... etc) | **"Fundamentals of Database Systems",Ramez Elmasri and Shamkant B. Navathe, 2017 (7th Edition) ISBN-10: 0133970779.** |
|---|---|
| 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** |
| Supporting people with | **Lab supervisors with experience in SQL programming** |

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| special needs | |
|---|---|
| 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 database fundamental, by understanding the main concepts, architecture, approaches, and history of the database system. | MK1 |
| K2 | awareness of the database relational model and languages | MK4 |
| K3 | Understanding of the database development process | Mk4 |
| K4 | | |
| | | |
| **Skills** | | |
| S1 | An ability to identify, formulates, and solve the database problems | MS2 |
| S2 | An ability to create Entity Relationship Diagram (ERD) | MS1 |
| S3 | An ability to create the relations model from the ERD | MS1, MS3 |
| S4 | An ability to use the SQL programming language to develop the database system | MS1 |
| | | |
| **Competences** | | |
| C1 | An ability to develop database systems in one or more significant 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.

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

| Week | Subject | learning style* | Reference ** |
|---|---|---|---|
| 1 | **Chapter 1 : Introduction to Databases**<br>• An Example of Database.<br>• Characteristics of database approach<br>• Actor on the scene<br>• Advantages of using DBMS<br>• A brief history of Database application<br>• When not to use a DBMS | **Lecture** | 34 - 57 |
| 2 | **Chapter 2: Database System Concept and Architecture**<br>• Data Model, Schema and Instance.<br>• Three schema architecture and data independence<br>• Database languages and Interfaces<br>• The Database System Environment<br>• Classification of DBMS | **Lecture** | **62 - 83** |
| 3 | **Chapter 3: Data modeling using ERD**<br>• A Sample Database Application<br>• Entity Types, Entity Set , Attributes and Keys | **Lecture** | **90 - 110** |
| 4 | • Relationship Types, Relationship sets, Roles and constraints.<br>• Weak entity. | **Lecture** | |
| 5 | **Chapter 4: The Enhanced ERD**<br>• Subclasses , Super-classes and Inheritances<br>• Specialization and Generalization.<br>• Constraints and characteristics of specialization and generalization.<br>• Modeling UNION Types using categories. | **Lecture** | **138 - 151** |
| 6 | **Chapter 5 : The Relational Data Model and Relational Database** | **Lecture** | **180 - 194** |

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| | **Constraints**<br>• Relational model concepts<br>• Relational model constraints and relational database schema | | |
|---|---|---|---|
| 7 | **Chapter 6 : Basic SQL**<br>• SQL data definition and data types<br>• Create ,Alter ,Drop , Rename and Truncate Statements | **Lecture** | **209-232** |
| 8 | • Specifying Constraints in SQL<br>• Basic Retrieval Queries in SQL | **Lecture** | |
| 9 | • Insert , update and Delete Statements in SQL<br>• Additional features of SQL | **Lecture** | |
| 10 | **Chapter 8: The Relational Algebra and Relational Calculus.**<br>Unary Relational Operation SELECT and PROJECT | **Lecture** | **271 - 294** |
| 11 | • Binary Relational Operation JOIN and DIVISION<br>Additional Relational Operations | **Lecture** | |
| 12 | **Chapter 9: Relational Database Design by ER and EER to Relational Mapping**<br>• Relational database design using ER to relational mapping<br>• Mapping EER model constructs to relations | **Lecture** | **320 - 333** |
| 13 | **Chapter 12 : Object and Object Relational Database**<br>• Overview of Object Database Concepts<br>• Object Database Conceptual Design | **Lecture** | 395 - 437 |
| 14 | **Chapter 14: Basics of Functional Dependencies and Normalization for Relational Databases**<br>• Informal design guidelines for relation schemas<br>• Functional dependencies<br>• Normal forms based on primary keys.<br>• General definitions of second and third normal forms | **Lecture** | 491-516 |
| 15 | **Final project discussion** | **Lecture** | **-** |

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| 16 | Final Exam | | |
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* 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 |
| --- | --- | --- | --- |
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