MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

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| **Module Information**  **معلومات المادة الدراسية** | | | | | | | |
| **Module Title** | Database system | | | | **Module Delivery** | | |
| **Module Type** | Core | | | | * **☒ Theory** * **☒ Lecture** * **☒ Lab** * **☒ Tutorial** * **☒ Practical** * **☐ Seminar** | | |
| **Module Code** | DASY221 | | | |
| **ECTS Credits** | 6 | | | |
| **SWL (hr/sem)** | 150 | | | |
| **Module Level** | | UGx11 2 | **Semester of Delivery** | | | | 4 |
| **Administering Department** | | Type Dept. Code | **College** | Type College Code | | | |
| **Module Leader** | Dr. Salma Hameedi Abdullah | | **e-mail** | Salma.h.abdullah@uotechnolgy.edu.iq | | | |
| **Module Leader’s Acad. Title** | | Assistant Professor | **Module Leader’s Qualification** | | | | Ph.D. |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | | | |
| **Peer Reviewer Name** | | Name | **e-mail** | E-mail | | | |
| **Scientific Committee Approval Date** | | 29/05/2024 | **Version Number** | | | 1.0 | |

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| **Relation with other Modules**  **العلاقة مع المواد الدراسية الأخرى** | | | |
| **Prerequisite module** | None | **Semester** |  |
| **Co-requisites module** | None | **Semester** |  |

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| **Module Aims, Learning Outcomes and Indicative Contents**  **أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية** | |
| **Module Objectives**  **أهداف المادة الدراسية** | This course aims to give the student an introduction to the basic concepts of data modeling and database design principles. This course focuses on the concepts and methods of building relational models between entities. The course also focuses on understanding database models and matching data to these models |
| **Module Learning Outcomes**  **مخرجات التعلم للمادة الدراسية** | 1. Define a Database, characteristics and functions of Database Management System and types of Database Users. 2. Distinguish between a Traditional File System and a Database System. 3. Compare the advantages and disadvantages of Database System with traditional File system. 4. Describe Data Models, Schemas, Instances, Three Schema Architecture and DBMS Component Modules. 5. Describe the Entity–Relationship (ER) modeling tool using Unified Modeling Language (UML). |
| **Indicative Contents**  **المحتويات الإرشادية** | Indicative content includes the following.   1. Conceptual understanding of database usage and design. 2. Relational data model and relational algebra. 3. ER diagrams and normalization. 4. SQL. 5. Indexing. 6. Transactions. 7. Code implementation. 8. User interface skills. |

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| **Learning and Teaching Strategies**  **استراتيجيات التعلم والتعليم** | |
| **Strategies** | * The teacher prepares lectures on the subject in electronic form and presents them to the students. * The teacher delivers lectures in detail. * The teacher requests periodic reports and homework assignments on the basic topics of the subject. * Working on a final project to put learnt concepts into action. |

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| **Student Workload (SWL)**  **الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا** | | | |
| **Structured SWL (h/sem)**  **الحمل الدراسي المنتظم للطالب خلال الفصل** | 93 | **Structured SWL (h/w)**  **الحمل الدراسي المنتظم للطالب أسبوعيا** | 6 |
| **Unstructured SWL (h/sem)**  **الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 57 | **Unstructured SWL (h/w)**  **الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 4 |
| **Total SWL (h/sem)**  **الحمل الدراسي الكلي للطالب خلال الفصل** | **150** | | |

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| **Module Evaluation**  **تقييم المادة الدراسية** | | | | | |
| **As** | | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 2 | 5% (5) | 5 | LO #1, #2 and #10, #11 |
| **Assignments** | 2 | 5% (5) | 12 | LO #3, #4 and #6, #7 |
| **Lab** | 1 | 20% (20) | Continuous | All |
| **Report/Project** | 1 | 10% (10) | 13 | LO #5, #8 and #10 |
| **Summative assessment** | **Midterm Exam** | 2hr | 10% (10) | 7 | LO #1 - #7 |
| **Final Exam** | 3hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)**  **المنهاج الاسبوعي النظري** | |
| **Week** | **Material Covered** |
| **Week 1** | * Introduction and brief history of Database * Characteristics of the database * Difference between File System & DBMS. * Advantages of DBMS * Functions of DBMS * Role of Database Administrator * Simplified Database System Environment * Example of a Database |
| **Week 2** | Database System Concepts and Architecture |
| **Week 3** | * Data Independence * Types of database applications * Data Models * The database system environment * Centralized and Client-Server DBMS Architectures |
| **Week 4** | Data Modeling using the Entity Relationship (ER) Model |
| **Week 5** | The Relational Data Model and Relational Database Constraints |
| **Week 6** | Entity-Relationship Design Issues Extended E-R Features |
| **Week 7** | Mid-term Exam |
| **Week 8** | Relational Database Design by ER and EER to Relational Mapping |
| **Week 9** | The Relational Algebra |
| **Week 10** | Relational Calculus |
| **Week 11** | Functional Dependencies and Normalization for Relational Databases |
| **Week 12** | * Introduction to transaction processing and management * Transaction and system concepts * Desirable properties of transactions * Transaction support in SQL |
| **Week 13** | * XML hierarchical (tree) data model * XML documents, DTD, and XML Schema |
| **Week 14** | * XML Documents and databases * XML Querying |
| **Week 15** | More advanced topic is Internet database. |
| **Week 16** | **Preparatory week before the final Exam** |

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| **Delivery Plan (Weekly Lab. Syllabus)**  **المنهاج الاسبوعي للمختبر** | |
| **Week** | **Material Covered** |
| **Weeks** | * The SQL SELECT Statement * The WHERE Clause * SQL INSERT INTO Statement * SQL UPDATE Statement * SQL DELETE Statement * SQL TOP Clause * SQL LIKE Operator * SQL Joins * SQL UNION Operator * SQL SELECT INTO Statement * SQL CREATE DATABASE Statement * SQL Constraints * SQL ALTER TABLE Statement * SQL Views * SQL Date Functions |

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| **Learning and Teaching Resources**  **مصادر التعلم والتدريس** | | |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | Elmasri and Navathe, "Fundamentals of Database Systems", Addison Wesley, 5th Edition, 2006  Silberschatz, Abraham, Henry F. Korth, and Shashank Sudarshan. "Database System Concepts.", 7th Edition, 2019. | Yes |
| **Recommended Texts** | Christof Strauch. NoSQL Databases (e-book) | No |
| **Websites** | <https://www.tutorialspoint.com/dbms/er_model_to_relational_model.htm> | |

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| **Grading Scheme**  **مخطط الدرجات** | | | | |
| **Group** | **Grade** | **التقدير** | **Marks %** | **Definition** |
| **Success Group**  **(50 - 100)** | **A -** Excellent | **امتياز** | 90 - 100 | Outstanding Performance |
| **B -** Very Good | **جيد جدا** | 80 - 89 | Above average with some errors |
| **C -** Good | **جيد** | 70 - 79 | Sound work with notable errors |
| **D -** Satisfactory | **متوسط** | 60 - 69 | Fair but with major shortcomings |
| **E -** Sufficient | **مقبول** | 50 - 59 | Work meets minimum criteria |
| **Fail Group**  **(0 – 49)** | **FX –** Fail | **راسب (قيد المعالجة)** | (45-49) | More work required but credit awarded |
| **F –** Fail | **راسب** | (0-44) | Considerable amount of work required |
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| **Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. | | | | |