**MODULE DESCRIPTION**

**Database management systems**

نموذج وصف مادة نظم إدارة قواعد البيانات

| **Module Information**  **معلومات المادة الدراسية** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Module Title** | Database **management systems** | | | | **Module Delivery** | | |
| **Module Type** | **Core** | | | | * **☒ Theory** * **☐ Lecture** * **☒ Lab** * **☐ Tutorial** * **☐ Practical** * **☐ Seminar** | | |
| **Module Code** | **BID31**4 | | | |
| **ECTS Credits** | **5.00** | | | |
| **SWL (hr/sem)** | **125** | | | |
| **Module Level** | | 3 | **Semester of Delivery** | | | | 5 |
| **Administering Department** | | BID | **College** | BMIC | | | |
| **Module Leader** | amaal hanash athaab | | **e-mail** | Amaal.hanash@uoitc.edu.iq | | | |
| **Module Leader’s Acad. Title** | | Assist lecturer. | **Module Leader’s Qualification** | | | | Msc. |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | | | |
| **Peer Reviewer Name** | | Omar A.M | **e-mail** | omara.m@uoitc.edu.iq | | | |
| **Scientific Committee Approval Date** | | 18/06/2023 | **Version Number** | | | 1.0 | |

| **Relation with other Modules**  **العلاقة مع المواد الدراسية الأخرى** | | | |
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| **Prerequisite module** | Data analysis and visualization / BID225 | **Semester** | 4 |
| **Co-requisites module** | None | **Semester** |  |

| **Module Aims, Learning Outcomes and Indicative Contents**  **أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية** | |
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| **Module Aims**  **أهداف المادة الدراسية** | 1. To develop problem solving skills and understanding of the theories of database management through the application of techniques.  2. To introduce the fundamentals of database modelling, design, implementation and management.  3. An ability to understand the ER Model Concepts and Relationships types.  4. To understand the structures of databases.  5. To understand the essential parts of the Roles and Attributes in Relationship and the constraints.  6. To learn and use the Relational Model Constraints and Relational Database Schemas.  7. This course deals with the basic concept of designing, creating and updating the data bases. 8. To understand the structured query language (SQL) in retrieving specific data from huge data. |
| **Module Learning Outcomes**  **مخرجات التعلم للمادة الدراسية** | 1. Introduction to Databases Management Systems, Basic Definitions, Main Characteristics of the Database Approach.  2. List the Data Models, Categories of data models. 3.  3. Entity-Relationship (Er) Model, ER Model Concepts, Types Of Attributes, 4. Entity Types and Key Attributes.  4. Understand Constraints on Relationships, Relationships And Relationship Types, Relational Model Concepts, Relational Integrity Constraints.  5. SQL Data Definition and Data Types, Retrieval Queries in SQL.  6. Understand The SELECT-FROM-WHERE Structure Queries.  7. Understand the operations in the select query.  8. Apply the SQL queries in medical data to retrieve specific information. |
| **Indicative Contents**  **المحتويات الإرشادية** | Indicative content includes the following.  Part A – database management systems  - Main Characteristics of the Database Approach  - Historical Development of Database Technology.  - Advantages and disadvantages of Using the Database Approach  Part B- Data Models - Categories of data models.  - Types of Data Models  . - Hierarchical model.  - Network model.  - Relational model.  Part C- Entity-Relationship (Er) Model  - ER Model Concepts  - Types Of Attributes  - Entity Types And Key Attributes  - Summary Of ER Diagram Notation For ER Schemas  - ER Diagram – Entity Types  Part D- Constraints on Relationships  • One to-one (1:1) Relationship.  • One to many(1:N) relationship.  • Many-to-one (N:1) Relationship.  • Many-To-Many (M:N) Relationship.  Part E - Relational Integrity Constraints  • Key Constraints.  • Entity Integrity.  • Referential Integrity constraints.  • Update Operations on Relations. Part F: Structured Query Language (SQL)  • SQL Data Definition and Data Types.  • How is Schema created? • Catalog Concept in SQL.  • The Create Table Command in SQL.  • Attribute Data Types and Domains in SQL  • Retrieval Queries in SQL.  • The Insert, Delete, And Update Statements In Sql.  • The nested queries, join, Aggregate Functions, and Grouping. |

| **Learning and Teaching Strategies**  **استراتيجيات التعلم والتعليم** | |
| --- | --- |
| **Strategies** | There are many strategies, first of them is Lecture-Based Teaching which is a traditional teaching method in which the teacher delivers a lecture to the students, presents the main concepts and principles of DBMS to the students, and provides examples and demonstrations to help them understand the material. Another type is Hands-On Learning involves providing students with practical experience working with a DBMS. In Group Projects and Collaborative Learning, students work in groups to complete a project or assignment. This approach emphasizes the development of teamwork and collaboration skills, and helps students to learn from each other's perspectives and experiences. while Case-Based Learning involves presenting students with real-world scenarios or cases that require them to apply their knowledge of DBMS to solve a problem. This approach helps students to develop critical thinking and problem-solving skills, and provides them with a deeper understanding of the practical applications of DBMS. the Online Learning platforms can be used to deliver lectures, provide access to course materials, and facilitate discussions and collaboration among student |

| **Student Workload (SWL)**  **الحمل الدراسي للطالب** | | | |
| --- | --- | --- | --- |
| **Structured SWL (h/sem)**  **الحمل الدراسي المنتظم للطالب خلال الفصل** | 64 | **Structured SWL (h/w)**  **الحمل الدراسي المنتظم للطالب أسبوعيا** | 4 |
| **Unstructured SWL (h/sem)**  **الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 61 | **Unstructured SWL (h/w)**  **الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 4 |
| **Total SWL (h/sem)**  **الحمل الدراسي الكلي للطالب خلال الفصل** | 125 | | |

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

| **Delivery Plan (Weekly Syllabus)**  **المنهاج الاسبوعي النظري** | |
| --- | --- |
| **Week** | **Material Covered** |
| **Week 1** | Introduction to Databases Management Systems. |
| **Week 2** | Data Models. |
| **Week 3** | ER Model Concepts and Relationships and Relationship Types. |
| **Week 4** | TheRoles and Attributes in Relationship and the constraint. |
| **Week 5** | Relational Model Concepts. |
| **Week 6** | The Relational Model Constraints and Relational Database Schemas. |
| **Week 7** | Midterm Exam |
| **Week 8** | SQL Data Definition and Data Types. |
| **Week 9** | The SELECT-FROM-WHERE Structure of Basic SQL Queries. |
| **Week 10** | Simple SQL queries, Aliases, \* and DISTINCT, Empty WHERE-clause. |
| **Week 11** | Substring Pattern Matching and Arithmetic Operators. |
| **Week 12** | Ordering and grouping of Query Results. |
| **Week 13** | Part 1: Joined Tables in SQL |
| **Week 14** | part2: Join Tables in SQL. |
| **Week 15** | Review and discuss |

| **Delivery Plan (Weekly Lab. Syllabus)**  **المنهاج الاسبوعي للمختبر** | |
| --- | --- |
| **Week** | **Material Covered** |
| **Week 1** | Lab 1: Introduction to dbms design. |
| **Week 2** | Lab 2: ER Data model design. |
| **Week 3** | Lab 3: ER Data model relationships. |
| **Week 4** | Lab 4: constraints design in ER Data model. |
| **Week 5** | Lab 5: design relational data model. |
| **Week 6** | Lab 6: design Constraints and Schemas of Relational Database |
| **Week 7** | Lab 7: design the structure of the database. |
| **Week 8** | Lab 8: update the structure of the database. |
| **Week 9** | Lab 9: fill the database with values and update the values. |
| **Week 10** | Apply Basic SQL Queries in the database. |
| **Week 11** | Apply Aliases, \* and DISTINCT, Empty WHERE-clause in queries. |
| **Week 12** | Apply Arithmetic Operators and functions in queries |
| **Week 13** | Apply Ordering and grouping of Query Results. Week 14 Apply joined tables. |
| **Week 14** | Apply joined tables |
| **Week 15** | Reveiw |

| **Learning and Teaching Resources**  **مصادر التعلم والتدريس** | | |
| --- | --- | --- |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | Fundamental of Database systems ,elmasri navathe , seventh edition, 2016 | No |
| **Recommended Texts** |  |  |
| **Websites** |  | |

| **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 |
|  |  |  |  |  |
| **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. | | | | |