



University/Academy: Arab Academy for Science and Technology & Maritime Transport
Faculty/Institute: College of Computing and Information Technology
Program: Information Systems / Computer Science / Software Engineering

Course title	Advanced Database systems
Course code	IS474

Form no. (11A)

Knowledge and skills matrix for a course

Course content	Week study	Knowledge	Intellectual skills	Professional skills	General skills
Introduction	1	<ul style="list-style-type: none"> Review what is a database? Review what is the database environment? Review the relational data structure Review the primary key and its integrity rule Review the foreign key and its referential integrity rule Review the relational database design (entity – attributes - relations) 	<ul style="list-style-type: none"> Demonstrate what is a database? Demonstrate the relational data structure Demonstrate the primary key and its integrity rule Demonstrate the foreign key and its referential integrity rule Demonstrate the relational database design (entity – attributes - relations) 	<ul style="list-style-type: none"> Practice the primary key and its integrity rule Practice the foreign key and its referential integrity rule Practice the relational database design (entity – attributes - relations) 	<ul style="list-style-type: none"> Enhance Skills of Description, formulation and analysis of Database problems
Web Database Basics	2	<ul style="list-style-type: none"> Relate why we need to study web databases Define web-related terms Describe Internet-related 	<ul style="list-style-type: none"> Demonstrate Internet-related languages Investigate some web database applications 	<ul style="list-style-type: none"> Practice the web-server functions Practice the Database creation and Deployment 	<ul style="list-style-type: none"> Enhance Computer Tools skills

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		languages <ul style="list-style-type: none"> List some web database applications Explain the requirements for the web-DBMS integration Explain the web DBMS Architecture (2-tier architecture) Explain the 3-tier architecture Explain the web-server functions Discuss the advantages and disadvantages of the web-DBMS approach 	<ul style="list-style-type: none"> Demonstrate the web-server function 	using MYSQL	
Web Database Tools	3	<ul style="list-style-type: none"> Identify client-side and server-side scripting technologies Connect Web pages to databases Use CSS to apply formatting to Web pages Identify the benefits of Dynamic HTML (DHTML) 	<ul style="list-style-type: none"> Demonstrate client-side and server-side scripting technologies Demonstrate how to Connect Web pages to databases Demonstrate the use of CSS to apply formatting to Web pages Demonstrate the benefits of Dynamic HTML (DHTML) 	<ul style="list-style-type: none"> Practice how to create webpages using Dreamweaver v4 Practice how to Connect Web pages to databases using PHP 	<ul style="list-style-type: none"> Enhance Computer Tools skills Enhance Team Working skills
Object Relational Mapping	4	<ul style="list-style-type: none"> Explain Object-Relational Mapping (ORM) Explain Java Persistence 	<ul style="list-style-type: none"> Demonstrate Object-Relational Mapping (ORM) 	<ul style="list-style-type: none"> Practice Object-Relational Mapping (ORM) Practice the New universal 	<ul style="list-style-type: none"> Enhance Skills of Description, formulation and

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		Architecture (JPA) <ul style="list-style-type: none"> • Explain Rules for Mapping an Object Model to a Relational Database • Explain Mapping Relationships • Explain Inheritance Mapping for single and multiple tables • Define the New universal data exchange format: XML 	<ul style="list-style-type: none"> • Demonstrate Java Persistence Architecture (JPA) • Demonstrate Rules for Mapping an Object Model to a Relational Database • Demonstrate Mapping Relationships • Demonstrate Inheritance Mapping for single and multiple tables • Apply the New universal data exchange format: XML 	data exchange format: XML	analysis of Database problems <ul style="list-style-type: none"> • Enhance Computer Tools skills
Data Warehousing	5	<ul style="list-style-type: none"> • Explain what is a data warehouse? • Define the Data warehouse architecture • Explain the Data warehousing sources of data • Explain the Dimensional Model (DM) • Explain the Cube Construction Models • Define Dimension's Concept Hierarchy 	<ul style="list-style-type: none"> • Demonstrate the Dimensional Model (DM) • Demonstrate the Cube Construction Models • Demonstrate Dimension's Concept Hierarchy Apply on a case study the three schemas (star-snowflake - starflake)	<ul style="list-style-type: none"> • Practice data warehousing concepts on a case study the three schemas (star-snowflake - starflake) • Apply the data warehousing process on SQL Server 	<ul style="list-style-type: none"> • Enhance Computer Tools skills • Enhance Skills of Description, formulation and analysis of Database problems • Enhance Team Working skills
OLAP	6	<ul style="list-style-type: none"> • Define OLAP • Discuss Why OLAP is 	<ul style="list-style-type: none"> • Demonstrate the OLAP Operations 	<ul style="list-style-type: none"> • Practice the OLAP Operations 	<ul style="list-style-type: none"> • Enhance Computer Tools skills

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		<p>needed?</p> <ul style="list-style-type: none"> • Explain the OLAP Operations • Explain the Aggregation process • Describe the Storage Modes: OLAP Servers • Discuss Querying OLAP cube with SQL 	<ul style="list-style-type: none"> • Demonstrate the Aggregation process • Demonstrate the Storage Modes: OLAP Servers 	<ul style="list-style-type: none"> • Apply Querying OLAP cube with SQL 	<ul style="list-style-type: none"> • Enhance Skills of Description, formulation and analysis of Database problems • Enhance Team Working skills
7 th week Exam	7	•	•	•	•
Large Data management Hadoop	8	<ul style="list-style-type: none"> • Explain what is Hadoop? • Explain the design principles for Hadoop • Explain what does Hadoop do • Describe the Hadoop Architecture 	<ul style="list-style-type: none"> • Demonstrate what does Hadoop do • Demonstrate the Hadoop Architecture 	<ul style="list-style-type: none"> • Practice what does Hadoop do 	<ul style="list-style-type: none"> • Enhance Skills of Description, formulation and analysis of Database problems • Enhance Oral Communication Skills
Hive	9	<ul style="list-style-type: none"> • Identify what is Hive • Define the Hive components • Discuss Hive usage at Facebook 	<ul style="list-style-type: none"> • Demonstrate what is Hive • Demonstrate Hive usage at Facebook 	<ul style="list-style-type: none"> • Practice the usage of Hive on different applications 	<ul style="list-style-type: none"> • Enhance Skills of Description, formulation and analysis of Database problems • Enhance Oral Communication Skills
Introduction to Data Mining	10	<ul style="list-style-type: none"> • Define data mining • Explain Why use data mining today? • Explain The knowledge 	<ul style="list-style-type: none"> • Demonstrate Define data mining through case studies • Demonstrate The 	<ul style="list-style-type: none"> • Practice WEKA • Practice data mining through case studies 	<ul style="list-style-type: none"> • Enhance Computer Tools skills

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		discovery process	knowledge discovery process		
Data Mining: Classification	11	<ul style="list-style-type: none"> Discuss why data preprocessing Explain the steps of the data preprocessing Define data integration and transformation Define the data mining model 	<ul style="list-style-type: none"> Demonstrate the steps of the data preprocessing Demonstrate data integration and transformation Demonstrate the data mining model 	<ul style="list-style-type: none"> Practice Classification through WEKA Practice the different types of classifiers 	<ul style="list-style-type: none"> Enhance Computer Tools skills Enhance Skills of Description, formulation and analysis of Database problems
12 th week Exam	12	•	•	•	•
Data Mining: Association Rules	13	<ul style="list-style-type: none"> Show the different types of classifiers Introduce decision trees Explain what is association rules 	<ul style="list-style-type: none"> Demonstrate the different types of classifiers Demonstrate decision trees Demonstrate what is association rules 	<ul style="list-style-type: none"> Practice association rules 	<ul style="list-style-type: none"> Enhance Computer Tools skills Enhance Skills of Description, formulation and analysis of Database problems •
Mobile Database	14	<ul style="list-style-type: none"> Describe Mobile database Show why is a Mobile Database Needed? Define the Mobile Database Architecture 	<ul style="list-style-type: none"> Demonstrate Mobile database Demonstrate the 	<ul style="list-style-type: none"> Practice Mobile database on a case study Practice the creation and deployment of such database on a real application 	<ul style="list-style-type: none"> Enhance Computer Tools skills
Projects' Discussion	15		•	•	<ul style="list-style-type: none"> Enhance Team Working skills Enhance Oral

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					Communication Skills

Course Instructor

Name

Signature:

Head of Department

Name:

Signature: