Template of Course Specification

Faculty: Computing & Information Technology

Department: Computer Science

Program: IS+ CS+ IT

I. General information about the course:						
1.	Course Title:	Introduction to Database				
2.	Course Code and Number :	CIT09				
3.	Credit Hours :	Lecture	Seminar/Tutorial	Practical	Training	Total
		2	*0*	*2*	*0*	*3*
4.	Study Level and Semester:	2th year , 1 semester				
5.	Pre-requisites (if any):	Problem Solving and Programming				
6.	Co-requisites (if any) :					
7.	Program in which the course is offered	CS, IS and IT				
8.	Teaching Language:	English/Arabic				
9.	Study System :	Credit hours				
0.	Prepared by :	Dr. Sadik Al-Taweel				
1.	Approval date :					
2.	Approved by:					

II. Course Description:

There are two principle goals for this course. First, to introduce the fundamental concepts necessary for the design and use of a database such as DBMS, relational model and relational algebra and calculus. Also basic stages of DB design and how to model the data using ERD and normalization will be introduced through the lectures. Another subject is the file organization and indexes will be covered. Second, to provide practical experience in applying these concepts using one of commercial database management systems which is Microsoft Access 2007 and SQL and require Problem Solving and Programming.

III. Course Aims

This course aims to:

1. Identify and discuss the basic concepts of relational database theory and the life cycle of a database.
2. Create, update, and manipulate data and control access to a database using structured query language and query by example language.
3. Identify the concepts of the entity-relationship model and develop an ER diagram using Unified Modeling Language (UML) for an applicable database.

4. Know the normalization concept and how to use it in database design to optimize the database structure.
5. Demonstrate the data organization and its physical storage and introduce the most used techniques for file organization.

VI. Course Intended Learning Outcomes (CILOs) :

Knowledge and Understanding:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Knowledge and Understanding PILOs	Knowledge and Understanding CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
A1 Demonstrate knowledge and understanding of essential concepts, principles and theories relating to computing and computer applications as appropriate to the program of study.	a1. Undrstand the meaning of the terms file-system, 'database and database management system' (DBMS)
A2 Recognize the criteria and specifications appropriate to specific problems, plan strategies for their solution.	a2. **Distinguish** the main stages of the database system development lifecycle (DSDLC) and **recognize** the main phases of database design: conceptual, logical, and physical design.

Intellectual Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Intellectual Skills PILOs	Intellectual Skills CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
B1 Model and design computer-based systems for the purpose of comprehension, communication, prediction and the understanding of trade-offs.	**b1.** Explore the purpose and origin of the three-level database architecture, contents of each level and classification of data models.
B4 Demonstrate computational thinking including its relevance to everyday life.	b2. Differentiate the connection between mathematical relations and relations in the relational model.

Professional and Practical Skills

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Professional and Practical Skills PILOs	Professional and Practical Skills CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
C1 Use effectively the tools for the construction and documentation of computer applications.	C1. **Implement** a diagrammatic technique for displaying an ER model using the Unified Modeling Language (UML). .
C2 Demonstration the effective deployment of computers to solve practical problems.	c2. Apply how to build SQL statements that: – use the WHERE clause to retrieve rows that satisfy various conditions; – sort query results using ORDER BY; – use the aggregate functions of SQL; – group data using GROUP BY; – use subqueries; – join tables together; – perform set operations (UNION, INTERSECT, EXCEPT).

Transferable (General) Skills :

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

Transferable (General) Skills PILOs	Transferable (General) Skills CILOs
After completing this program, students would be able to:	After completing this course, students would be able to:
D5 Appreciate the need for continuing professional development in recognition for lifelong learning.	**d1. Estimate how to identify the most commonly used normal forms, namely First Normal Form (1NF), Second Normal Form (2NF), and Third Normal Form (3NF).** **d2. Justify when to use denormalization.**

VI. Alignment of CILOs to Teaching and Assessment Strategies

First: Alignment of Knowledge and Understanding CILOs

Knowledge and Understanding CILOs	Teaching Strategies	Assessment Strategies
a1. Undrstand the meaning of the terms file-system, 'database and database management system' (DBMS) a2. **Distinguish** the main stages of the database system development lifecycle (DSDLC) and **recognize** the main phases of database design: conceptual, logical, and physical design.	Direct teaching (lectures, groups discussions, problem solving, tutorials)	**Writing Exams, Quiz, discussion Observation**

Second: Alignment of Intellectual Skills CILOs

Intellectual Skills CILOs	Teaching Strategies	Assessment Strategies
b1. Explore the purpose and origin of the three-level database architecture, contents of each level and classification of data models. b2. Differentiate the connection between mathematical relations and relations in the relational model.	Interactive learning (forums, cooperative learning), Case study, Experimental learning and Survey	Assignments, quizzes, problem formulation, Exams, Technical reports and presentation.

Third: Alignment of Professional and Practical Skills CILOs

Professional and Practical Skills CILOs	Teaching Strategies	Assessment Strategies
C1. **Implement** a diagrammatic technique for displaying an ER model using the Unified Modeling Language (UML). c2. How to build SQL statements that: use the WHERE clause to retrieve rows that satisfy various conditions; – sort query results using ORDER BY; – use the aggregate functions of SQL; – group data using GROUP BY; – use subqueries; – join tables together; – perform set operations (UNION, INTERSECT, EXCEPT).	- Direct teaching (tutorials, problem solving) - Interactive learning (cooperative learning). Case study, Presentation, Experimental learning, projects and survey.	Assignments, Case study, exams ,Tech reports and Presentation.

Fourth: Alignment of Transferable (General) Skills CILOs

Transferable (General) Skills CILOs	Teaching Strategies	Assessment Strategies
d1. Estimate how to identify the most commonly used normal forms, namely First Normal Form (1NF), Second Normal Form (2NF), and Third Normal Form (3NF). **d2. Justify when to use denormalization.**	Presentation , discussion , discussion groups ,Seminars , Role change playing ,E-learning, Interactive learning (cooperative learning) , Projects , Tutorials , case study, Research, Self learning	Tech Reports, Assignments, Exam.

الموصف	المراجع	مسؤول البرنامج	رئيس القسم	عميد الكلية
		أ.وديع القباطي	أ.نبيل المخلافي	د. عبدالقادر العبادي

VII. Course topics and sub-topics (theoretical and practical) with contact hours and alignment to CILOs

Topics/Units of Course Contents					
First: Theoretical Aspects					
No.	**Course Topics/Units**	**Sub-topics**	**No. of Weeks**	**Contact Hours**	**CILOs**
1	**Introduction to Database Systems**	Traditional File-Based Systems Database Approach Roles in the Database Environment History of DBMS Advantages and Disadvantages of DBMSs	1	2	a1,a2
2	**Database Environment**	Three-Level ANSI-SPARC Architecture Database Languages Data Models and Conceptual Modeling Functions of a DBMS Components of DBMS Multi-User DMBS Architectures	1	2	a2,b1,b2
3	**Relational Data Model**	Relational Model Origins and Terminology Relational Keys and Integrity Constraints Views Relational Algebra and Relational Calculus	3	6	a2,b1
4	**Database Planning, Design and Administration**	Database System Development Lifecycle Database Planning and System Definition Requirements Collection and Analysis Database Design Phases and DBMS Selection Database and Data Administration Fact-Finding Techniques	2	4	a2, b1
5	**Mid Term Exam**		1	2	
6	**Entity-Relationship Data Model**	Entity and Relationship Types Attributes Strong and Weak	2	4	c1,c2

الموصف	المراجع	مسؤول البرنامج	رئيس القسم	عميد الكلية
		أ.وديع القباطي	أ.نبيل المخلافي	د. عبدالقادر العبادي

		Entity Types Attributes on Relationships Structural Constraints Problems with ER Models			
7	**Relational Database Design, Normal Forms**	Normalization Purpose and Advantages Data Redundancy and Update Anomalies Functional Dependencies 1NF, 2NF and 3NF	2	4	a2, b1, c1,c2,d1
8	**File Organizations and Indexes**	Secondary Storage Devices File Organization Concepts and Techniques Indexes Guidelines for Selecting File Organization	2	4	d2
9	Revision		1	2	
10	Final Term exam		1	2	
	Total number of weeks and hours		**16**	**32**	

Second: Practical/Tutorial/Clinical Aspects				
Write up practical/tutorial/clinical topics				
No.	**Practical/Tutorial/Clinical topics**	**No. of Weeks**	**Contact Hours**	**CILOs**
1	**Introduction to Access**	1	**2**	**c1**
2	**Types Records in Access**	1	**2**	**c1**
3	**Forms and Query**	1	**2**	**c1,c2**
4	Introduction to SQL	1	**2**	**c2**
5	**Create Tables**	**1**	**2**	**c2**
6	**Constraints on Tables**	1	**2**	**c2**
7	**Date changing**	1	**2**	**c2**
8	**Midterm Exam**	**1**	**2**	**c2**
9	**Select Statement**	**1**	**2**	**c2**
10	**Order Data**	**1**	**2**	**c2**
11	**Joint**	**1**	**2**	**c2**
12	**Sub-queries**	**2**	**4**	**c2**
13	**Functions**	**1**	**2**	**c2**
14	**Final Exam**	**1**	**2**	

الموصف	المراجع	مسؤول البرنامج	رئيس القسم	عميد الكلية
		أ.وديع القباطي	أ.نبيل المخلافي	د. عبدالقادر العبادي

15	**Projects Discussions**	1	2	c1,c2
Total number of weeks and hours		16	32	

I. Teaching Strategies

- Direct teaching (lectures, groups discussions, problem solving, tutorials)

-Interactive learning (forums, cooperative learning)

-Case study, Experimental learning, Presentation, projects and Survey

-discussion groups ,Seminars , Role change playing ,E-learning, Research

-Self learning

II. Tasks and Assignments :

No.	Task/Assignment	CILOs	Week due	Mark
1	Assignment1		4	3
2	Quiz1		6	2
3	Midterm Exam		8	20
4	Assinment2		11	3
5	Quiz2		13	2
6	Lab		16	20
7	Final Exam		16	50

III. Learning Assessment:

No.	Assessment Tasks	Week due	Mark	Proportion of Final Assessment	Aligned CILOs
1	Homework/Tasks/Assignments		6		
2	Quiz 1		2		

3	Midterm Exam		20		
4	Quiz 2		2		
5	Lab		20		
6	Final Exam		50		
Total			100		

IV. Learning Resources :

(Author, (Year), Book Title, Edition, Publisher, Country of publishing)

Textbooks-not more than 2

Thomas Connolly and Carolyn Begg, *Database Systems, A Practical Approach to Design, Implementation, and Management*, 4th Edition, Addison-Wesley, 2005 (ISBN: 0321210255)

Essential References-not less than 4

1. R. Elmasri and S.B. Navathe, *Fundamentals of Database Systems*, Benjamin/Cummings, 2nd Edition, 1994
2. A. Silberschatz, H.F. Korth and S. Sudarshan, *Database System Concepts*, McGraw Hill, 4th Edition, 2002

Electronic Materials and Web Sites

1.
2.
3.

V. Course Policies (To be determined by Faculty Deanship):

Based on university regulations, the following aspects should be figured out:

1.	(Class Attendance) :
2.	(Tardy) :
3.	(Exam Attendance/Punctuality) :
4.	(Assignments & Projects) :
5.	(Cheating) :
6.	(Plagiarism) :
7.	(Other policies) :

الموصف	المراجع	مسؤول البرنامج	رئيس القسم	عميد الكلية
		أ.وديع القباطي	أ.نبيل المخلافي	د. عبدالقادر العبادي

Template of Course Syllabus

Faculty : Computing & Information Technology

Department : Computer Science

Program : IS, CS and IT

I. General information about the course instructor :							
Name	Dr. Sadik Al-Taweel	Office Hours(3 Hours Weekly)					
Location & phone number	Information System Department Ex.4356- H/P 771878875	Sat	Sun	Mon	Tue	Wed	Thu
Email	Dr.sadiq@ust.edu	10-11		12-1	10-11		

II. General information about the course:						
1.	Course Title :	Introduction to Database				
2.	Course Code and Number :	CIT09				
3.	Credit Hours :	Credit Hours				Total
		Theoretical	Seminar/Tutorial	Practical	Training	
		2	0	2	0	3
4.	Study Level and Semester:	2th year , 1 semester				
5.	Pre-requisites (if any):	Problem Solving and Programming				
6.	Co-requisites (if any):					
7.	Program in which the course is offered:	CS, IS and IT				
8.	Teaching Language:	English/Arabic				
9.	Instruction location:	Information System Department Faculty of Computing & Information Technology				

I. Course Description

There are two principle goals for this course. First, to introduce the fundamental concepts necessary for the design and use of a database such as DBMS, relational model and relational algebra and calculus. Also basic stages of DB design and how to model the data using ERD and normalization will be introduced through the lectures. Another subject is the file organization and indexes will be covered. Second, to provide practical experience in applying these concepts using one of commercial database management systems which is Microsoft Access 2007 and SQL and require Problem Solving and Programming.

II. Course Aims:

This course aims to:

1) Identify and discuss the basic concepts of relational database theory and the life cycle of a database.
2) Create, update, and manipulate data and control access to a database using structured query language and query by example language.
3) Identify the concepts of the entity-relationship model and develop an ER diagram using Unified Modeling Language (UML) for an applicable database.
4) Know the normalization concept and how to use it in database design to optimize the database structure.
5) Demonstrate the data organization and its physical storage and introduce the most used techniques for file organization.

III. Course Intended Learning Outcomes (CILOs) :

IV. Course Contents

Theoretical Aspect:

No.	Course Units	Sub-topics	Week due	Contact Hours
1	**Introduction to Database Systems**	Traditional File-Based Systems Database Approach Roles in the Database Environment History of DBMS Advantages and Disadvantages of DBMSs	1	2
2	**Database Environment**	Three-Level ANSI-SPARC Architecture Database Languages Data Models and Conceptual Modeling Functions of a DBMS Components of DBMS Multi-User DMBS	1	2

		Architectures		
3	**Relational Data Model**	Relational Model Origins and Terminology Relational Keys and Integrity Constraints Views Relational Algebra and Relational Calculus	3	6
4	**Database Planning, Design and Administration**	Database System Development Lifecycle Database Planning and System Definition Requirements Collection and Analysis Database Design Phases and DBMS Selection Database and Data Administration Fact-Finding Techniques	2	4
5	**Mid Term Exam**		1	2
6	**Entity-Relationship Data Model**	Entity and Relationship Types Attributes Strong and Weak Entity Types Attributes on Relationships Structural Constraints Problems with ER Models	2	4
7	**Relational Database Design, Normal Forms**	Normalization Purpose and Advantages Data Redundancy and Update Anomalies Functional Dependencies 1NF, 2NF and 3NF	2	4
8	**File Organizations and Indexes**	Secondary Storage Devices File Organization Concepts and Techniques Indexes Guidelines for Selecting File Organization	2	4
9	Revision		1	2
10	Final Term exam		1	2
Total number of weeks and hours			**16**	**32**

الموصف	المراجع	مسؤول البرنامج	رئيس القسم	عميد الكلية
		أ.وديع القباطي	أ.نبيل المخلافي	.د عبدالقادر العبادي

Second: Practical/Tutorial/Clinical Aspects :			
Write up practical/tutorial/clinical topics			
No.	**Practical/Tutorial/Clinical topics**	**No. of Weeks**	**Contact Hours**
1	**Introduction to Access**	1	2
2	**Types Records in Access**	1	2
3	**Forms and Query**	1	2
4	Introduction to SQL	1	2
5	**Create Tables**	1	2
6	**Constraints on Tables**	1	2
7	**Date changing**	1	2
8	**Midterm Exam**	1	2
9	**Select Statement**	1	2
10	**Order Data**	1	2
11	**Joint**	1	2
12	**Sub-queries**	2	4
13	**Functions**	1	2
14	**Final Exam**	1	2
15	**Projects Discussions**	1	2
Total number of weeks and hours		16	32

V. Teaching Strategies

- Direct teaching (lectures, groups discussions, problem solving, tutorials)

-Interactive learning (forums, cooperative learning)

-Case study, Experimental learning, Presentation, projects and Survey

-discussion groups ,Seminars , Role change playing ,E-learning, Research

-Self learning

VI. Tasks and Assignments

No.	Task/Assignment	Week due	Mark
1.	Assignment1	**4**	**3**
2.	Quiz1	**6**	**2**
3.	Midterm Exam	**8**	**20**
4.	Assinment2	**11**	**3**
5.	Quiz2	**13**	**2**
6.	Lab	**16**	**20**
7.	Final Exam	**16**	**50**

الموصف	المراجع	مسؤول البرنامج	رئيس القسم	عميد الكلية
		أ.وديع القباطي	أ.نبيل المخلافي	د. عبدالقادر العبادي

VII. Learning Assessment:

No.	Assessment Tasks	Assessment day & date	Mark	Weight
1	Homework/Tasks/Assignments		6	6%
2	Quiz 1		2	2%
3	Midterm Exam		20	20%
	Quiz 2		2	2%
	Lab		20	20%
	Final Exam		50	50%
	Total		100	100%

VIII. Learning Resources

1. Textbooks:

Thomas Connolly and Carolyn Begg, *Database Systems, A Practical Approach to Design, Implementation, and Management*, 4th Edition, Addison-Wesley, 2005 (ISBN: 0321210255)

2. Essential References:

1. R. Elmasri and S.B. Navathe, *Fundamentals of Database Systems*, Benjamin/Cummings, 2nd Edition, 1994
2. A. Silberschatz, H.F. Korth and S. Sudarshan, *Database System Concepts*, McGraw Hill, 4th Edition, 2002

3. Electronic Materials and Web Sites:

IX. Course Policies (To be determined by Faculty Deanship)

1.	Class Attendance :
2.	Tardy :
3.	Exam Attendance/Punctuality:
4.	Assignments & Projects:
5.	Cheating:
6.	Plagiarism:
7.	Other policies:

الموصف	المراجع	مسؤول البرنامج	رئيس القسم	عميد الكلية
		أ.وديع القباطي	أ.نبيل المخلافي	د. عبدالقادر العبادي