Ministry of Higher Education and Scientific research



Department of Software

College of Engineering

Salahaddin University-Erbil

Subject: Database Principles

Course Book -

Bologna process(course of Database Principles)

Lecturer's name Hanan Kamal

Ministry of Higher Education and Scientific research

1. Course name	Database Principles
2. Lecturer in charge	Hanan Kamal
3. Department/ College	Software and Informatics /Engineering
4. Contact	e-mail: hanan.abdulkarim@su.edu.krd
5. Time (in hours) per week	Theory: 2 h/w
	Practical: 2 h/w
6. Office hours	9:00-12:00 for Monday and Tuesday
7. Course code	
8. Teacher's academic	I am a lecturer and hold BSc. And MSc. degree in Software
profile	Engineering. Interested in optimization, programming
	methodology, algorithm design, software engineering and
	robotics.
9. Keywords	DB, DBMS, SQL

Course Book

10. Course overview:

The Database Principles course very important topics of DB will be given to the students, the topics start from Introduction to the DB till DB representation. It will help the student to know the idea of the DB and how to represent the DB for Conceptual till physical schemas. The relational models for designing DB also will be explained, at the end of this course the students should be able to represent a DB and can implement some DB principles in practical.

11. Course objective:

The major objectives:

- Understand the fundamentals of database technology
- Learn the data models to manipulate with the DB
- Understand modeling concepts of the Entity-Relationship (ER) model
- learn theory of normal forms and functional dependency

12. Student's obligation

- > Attendance is required according to the Subject rules.
- > The use of mobile phone during the class is prohibited.
- Only the students who are officially enrolled can attend the class, guests and children are not admitted.
- > Daily participation and conducting assignments are required.

13. Forms of teaching

The lecture slides will be provided in the class and will be the core of the course, however additional reference pages will advise to read. Moreover to slides the white board and pen are used to explain some complex idea.

Note: There will be quizzes.

14. Assessment scheme

The course breaks down into the lectures, and practical sessions. There are exams to assess each student; midterm exam, class activity, and the final exam. The course had a theoretical exam of 20, and practical exam of 15, and 15 marks for activities and home works or quiz during course. The total marks will be as follows:

Theoretical exam (midterm): 20%

(If student fail with low marks (s)he will not enter to the final)			
Practical exam (or assignment):	10%		
Activities, assignment and Quiz:	20%		
Average Marks is:	50%		
Final Exam: 50 %:			

• Theory 30%

• Practical 20%

15. Student learning outcome:

At the of this course students should learn:

- Know principles of DB
- Understand Architecture of DB.
- Know terminology used in DB.
- DB applications.
- Know Functions of the DBMS.
- How to collect information for DB.
- Create Entity relationship diagram for DB.
- Write Relational Algebra for queries.
- Normalize their information depending techniques and create their DB tables.
- Find tables depend of functional dependency and then normalization.

16. Course Reading List and References:

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Ministry of Higher Education and Scientific research

- Database processing fundamentals, design and implementation, David m. Kroenke and David J.Auer, Western Washington University 2012.
- Database systems, Thomas connolly and Carolyn beg, 4th edition, USA, 2005.
- Fundamentals of Database Systems, Ramez Elmasri and Shamkant B. Navathe, 6th edition, NY, 2010.
- DATABASE PROCESSING FUNDAMENTALS, DESIGN, AND IMPLEMENTATION, David M. Kroenke , David J. Auer, Scott L. Vandenberg, Robert C. Yoder , 5th edition.

17. The Topics:	Lecturer's name
	Hanan Kamal
	(2hrs)
Week 1: Introduction to DR. DRMS	
Week 1. Introduction to DB, DBIVIS	
Week 2: Database Environment	
Week 3: The Relational Algebra	
Week 4. Relational Algebra (cont.)	
Week 5: Relational Algebra (cont.)	
Week 7: Entity-relationship modelling	
Week 8 : Entity-relationship modelling(cont.)	
Week 10, 11, 12: Normalization and functional dependency	
Week 13: midterm exam	
Week 14: Assignment	
18. Practical Topics (If there is any)	
	Hanan Kamal
	(2 hrs)
Week 1: Introduction to DB and access	
Week 2: Create Table	
Week 3: Attribute types and properties	
Week 4: Attribute types and properties(cont.)	
Week 5: relationships and referential integrity	
Week 6: Queries (select)	
Week 7: Queries (update)	
Week 8 : Queries (delete)	
Week 9: Queries (append)	
Week 10, 11, 12: Forms	
Week 13: Connections	
Week 14: report	
Week 15: Macro	

19. Examinations:

Q/Answer each of the following with one sentence only: (20 marks, 2 for each)

- 1. What is meant by the degree of a relationship? Count the degrees.
- 2. Relations that contain redundant information may potentially suffer from update anomalies, what are these anomalies?
- 3. What is $(R \cap S)$ in RA?
- 4. Define 3rd normal form in normalization.

Q/Consider the following MAILORDER relational schema describing the data for a mail order company.

(30 marks) PARTS(<u>Pno</u>, Pname, Qoh, Price, Olevel) CUSTOMERS(<u>Cno</u>, Cname, Street, Zip, Phone) EMPLOYEES(<u>Eno</u>, Ename, Zip, Bdate) ZIP_CODES(<u>Zip</u>, City) ORDERS(<u>Ono</u>, <u>Cno</u>, <u>Eno</u>, Received, Shipped) ODETAILS(<u>Ono</u>, <u>Pno</u>, Quantity)

Qoh stands for (quantity on hand): the other attribute names are self-explanatory. Specify the following RA queries on the MAILORDER database schema.

1. [3 marks] Retrieve the part name and customer name, which their received order is '2018-1-1'.

Q/Specify which of the following statements (True) OR (False), correct the false statement.

- 1. $R \Join_F S$ Defines a relation that is the concatenation of every tuple of relation R with every tuple of relation S.
- 2. Insulation between programs and data is each user may see a different view of the database.
- 3. (_ and ?) is special pattern matching symbols used for any single character in the SQL.
- 4. The key word order by used before column name to eliminate duplicates.

20. Extra notes:

Note : Bologna system is 15 weeks not 16 week course.

21. Peer review