DATABASE SYSTEMS

CONTACT

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❑Course Site: BKEL

COURSE INTRODUCTION

❑Subject: Database Systems

❑Number: CO2013

❑Credits: 4

❑Length: 45 units

❑Prerequisite: None

❑Online learning: video lecture on BKeL

❑Class Periods: 12 weeks

LECTURE VIDEO

- Go to your BKeL

- One video page for all classes

- Syllabus

COURSE AIMS

❑This course is to introduce

o The history and motivations for database systems

o Architecture and components of a database system

o Conceptual and logical data models such as entity relationship model and relational data model

o Relational algebra

o Structured Query Language (SQL)

o Database design methodologies as well as data storage, management, and security issues with database management systems to develop database applications effectively for information systems.

LEARNING OUTCOMES (1/4)

❑L.O.1 – Explaining basic concepts (data, data model, database, database system, the relational data model, the relational algebra, SQL, database design methodology, the entity relationship model, data normalization, database application), understand the architecture of a database system, describe the components of a database system.

- L.O.1.1 – Demonstrate basic concepts: data, database, data model, database system.
- L.O.1.2 – Understand architecture of a database system.
- L.O.1.3 – Describe the components of a database system.
- L.O.1.4 – Explain the relational data model, relational algebra, and SQL.
- L.O.1.5 – Explain database design methodologies, entity relationship model, data normalization.
- L.O.1.6 – Define database applications.

LEARNING OUTCOMES (2/4)

❑L.O.2 – Designing a database using the entity relationship model, the relational data model and a database design methodology to meet data requirements of a particular database application.

- L.O.2.1 – Use the relational data model.

- L.O.2.2 – Use the entity relationship model and its extended versions.

- L.O.2.3 – Prepare a relational schema from a conceptual schema developed using the entity relationship model and its extended versions in such a way that data requirements of a given database application are satisfied.

- L.O.2.4 – Demonstrate functional dependencies of a relation.

- L.O.2.5 – Define a key of a relation with given functional dependencies.

- L.O.2.6 – Determine a normal form (1NF, 2NF, 3NF, BCNF) of a relation based on its given primary key and functional dependencies.

LEARNING OUTCOMES (3/4)

❑ L.O.3 – Using the SQL language and an existing database management system (DBMS) such as MySQL, Oracle, and MS SQL Server.

  o L.O.3.1 – Write data definition and manipulation (query, insertion, deletion, and update) statements as well as procedures/functions/triggers for data processing in SQL.

  o L.O.3.2 – Install and configure an existing database management system such as MySQL, Oracle, and MS SQL Server.

  o L.O.3.3 – Develop database applications on top of an existing database management system.

LEARNING OUTCOMES (4/4)

❑L.O.4 – Identifying an appropriate approach (a file processing approach or a DBMS approach) to efficiently developing applications of an information system.

o L.O.4.1 – Explain the characteristics that distinguish the database approach from the approach of programming with data files.

o L.O.4.2 – Explain the concept of data independence and its importance in a database system.

o L.O.4.3 – Evaluate appropriateness and effectiveness of data management for applications in an information system.

OUTLINE

❑ Chapter 1: Database Systems in Overview

❑ Chapter 2: Entity Relationship Model

❑ Chapter 3: Relational Model

❑ Chapter 4: Structured Query Language

❑ Chapter 5: Database Design Methodologies

❑ Chapter 6: Database Storage and Management

❑ Chapter 7: Database Security

❑ Chapter 8: Open Research

ASSESSMENT

☐ **No** Midterm Test

☐ Seminar (S)
- Weight: 20%
- Grouping: 4-5 members per group

☐ Practice (P)
- Weight: 30%

☐ Final Test (T)
- Weight: 50%
- Quizzes and written test: 90 minutes

➔ **Final Score = (20% * S) + (30% * P) + (50% * T)**

➔ **AND No Nullable scores**

SEMINAR (1/2)

❑Forming a group
  o 4-5 members

❑Choosing a non-identical topic

❑Registration link (on BKeL)

❑Due date (on BKeL)

SEMINAR (2/2)

❏ Making a presentation video
- 20 min presentation for each group
- Focus on
  - What? (2 marks)
  - How? (5 marks)
  - Why is it useful? (1.5 marks)
  - Demo (1.5 marks)

❏ Team representative submits the work on behalf of the team

❏ Submission on BKeL (Do not forget to press the "submit" button)

TEXT BOOKS & REFERENCES

1. Fundamentals of Database Systems, 7th Edition – R. Elmasri & S.B. Navathe, AddisonWesley, 2016.

2. Database Systems Using Oracle – A Simplified Guide to SQL and PL/SQL, 2nd Edition - N. Shah, Prentice Hall, 2005.

3. Database Systems – A Practical Approach to Design, Implementation, and Management, 6th Edition – T. Connolly & C. Begg, Addison-Wesley, 2015.

4. Database Management Systems, 2nd Edition – R. Ramakrishnan & J. Gehrke, McGraw-Hill, 2001.

5. Database Systems Concepts, 6th Edition – A. Silberschatz, H.F. Korth & S. Sudarshan, McGraw-Hill, 2006.

6. Database Systems – The Complete Book – H.G. Molina, J.D. Ullman & J. Widom, PrenticeHall, 2002.

SOFTWARES

- Oracle DB Express Edition 11g R2

- Oracle SQL Developer

QUESTIONS AND ANSWERS

Picture from: http://philadelphiasculpturegym.blogspot.com/2013/09/save-date-free-talk-and-q-on-affordable.html