Mansoura University
Faculty of Computers and Information
Department of Information System
First Semester- 2020-2021

[IS313P] Database System II

Grade: 3 rd. IS & IT

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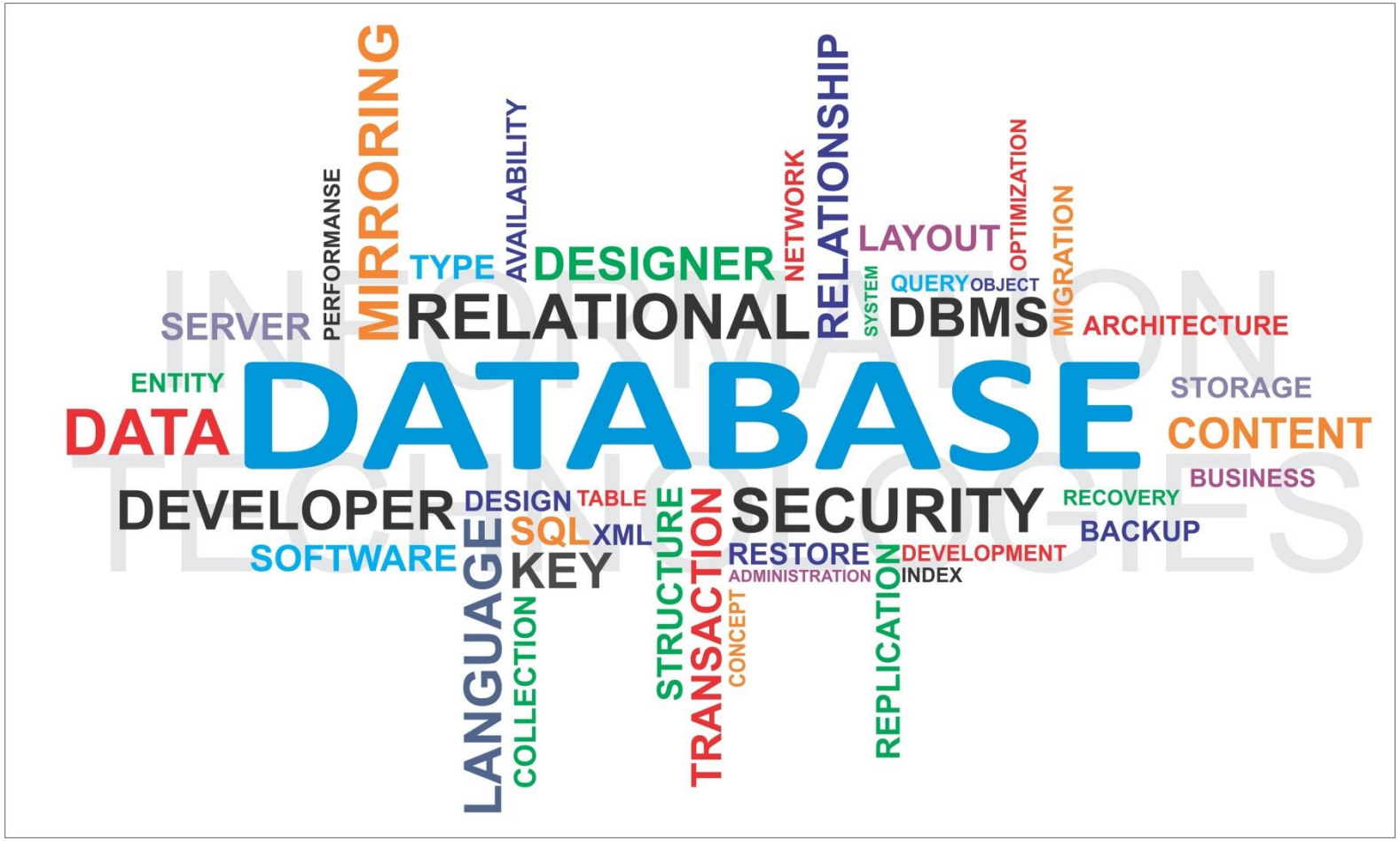
AGENDA

- Quick Review
- Course Description
- Outline
- Main Topics

LET'S REMEMBER WHAT IS DATABASE



QUICK REVIEW: PURPOSE OF DATABASE SYSTEM

- In the early days, database applications were built on top of file systems
- Drawbacks of using file systems to store data:
  - Data redundancy and inconsistency
    - Multiple file formats, duplication of information in different files
  - Difficulty in accessing data
    - Need to write a new program to carry out each new task
  - Data isolation — multiple files and formats
  - Integrity problems
    - Integrity constraints (e.g., account balance > 0) become "buried" in program code rather than being stated explicitly
    - Hard to add new constraints or change existing ones

QUICK REVIEW: PURPOSE OF DATABASE SYSTEM

- Drawbacks of using file systems (cont.)
  - Atomicity of updates
    - Failures may leave database in an inconsistent state with partial updates carried out
    - Example: Transfer of funds from one account to another should either complete or not happen at all
  - Concurrent access by multiple users
    - Concurrent access needed for performance
    - Uncontrolled concurrent accesses can lead to inconsistencies
      - Example: Two people reading a balance (say 100) and updating it by withdrawing money (say 50 each) at the same time
  - Security problems
    - Hard to provide user access to some, but not all, data

Database systems offer solutions to all the above problems

COURSE DESCRIPTION

- This is an advanced course in database system
  - Student must review the following topics
    - What is a database system?
    - Database System Concepts and Architecture
    - The Relational Data Model and Relational Database Constraints
    - Data Modeling Using the Entity-Relationship (ER) Model
    - Basics of Functional Dependencies and Normalization for Relational Databases
    - Basic SQL

WHAT ARE YOUR EXPECTATIONS FROM THIS COURSE?

COURSE OBJECTIVES

- The Goal of this course is making the student able to:
- Recognize problems that are amenable to computer information systems, and knowledge of the tools necessary for solving such problems.
- Use, compare and evaluate a range of formal and informal techniques, theories and methods to develop computing and information applications.
- Consider and deal with the individual, social, environmental, organizational and economic implications of the application of computing and information.
- Aware of key ethical issues affecting information systems and their responsibilities as information science professionals.

OUTLINE

- Book:
  - **Elmasri & Navathe**, "Fundamentals of database systems", 6th ed.
  - **Date**, "An introduction to database systems", 8th ed.
  - **Connolly & Begg,** "Database system database A Practical Approach to Design, Implementation, and Management, 4th ed.
- Grading
  - 10% Quiz
  - 10% Practical Exam
  - 10% Oral Exam
  - 10% mid-term Exam

MAIN TOPICS

- Introduction to Transaction Processing Concepts
- Concurrency Control
- Database Recovery
- Database Security
- Database Integrity
- The Relational Algebra and Relational Calculus
- Query Processing and Optimization
- Introduction to Object-Oriented DBMSs
- Introduction to Distributed Database
- Introduction to NoSQL Databases

- Thank You

NEXT: INTRODUCTION TO TRANSACTION PROCESSING CONCEPTS