CHAPTER 0
Course Introduction

KHOA CÔNG NGHỆ THÔNG TIN
TRƯỜNG ĐẠI HỌC KHOA HỌC TỰ NHIÊN

General Information

- Course name: Database Management Systems
- Course name (in Vietnamese): Hệ quản trị CSDL
- Course ID: CTT203
- Number of credits: 4 (3 for theory and 1 for practice)
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Outline

- Course goals
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Course goals

- Knowledge:
  - Describes the general architecture of a DBMS
  - Operate on a relational database consistently using transaction processing concepts and theory
  - Use concurrency control techniques provided by DBMSs
  - Describe the techniques used by DBMSs for database recovery from failures
  - Apply security mechanisms provided by DBMSs in real-world applications
  - Comprehend the way data is stored or retrieved on storage devices
  - Comprehend the query processing algorithms and query optimization methods
  - Apply functions provided by SQL Server together with a programming language in real-world information systems

Course goals (cont)

- Skills:
  - Work independently or in group to apply principles of RDBMSs
  - Perform the reading comprehension skills, present and write simple reports in English
  - Use the functions of a RDBMS, analysis and design to solve real-world information systems

Course Outcomes

CO	Description
G1.1	Demonstrate independent work on quizzes and homework
G1.2	Demonstrate working in pair or group on the project
G2.1	Conduct textbook reading on different chapters and summarize the key features
G2.2	Show the understanding on a given topic of a DBMS and its application via report writing
G3.1	Apply principles of a DBMS to analyze an information system
G3.2	Apply functions provided by a DBMS to design an information system
G4.1	Describe the roles and relationships between components of a DBMS

Course outcomes (cont.)

CO	Description
G5.1	Describe the desirable properties of transactions
G5.2	Operate on database consistently using transactions
G6.1	Describe concurrency control techniques used in RDBMSs
G6.2	Apply some concurrency control technique in a real-world information systems
G7.1	Describe database recovery techniques used in RDBMSs
G7.2	Explain the state of databases after recovery from failures

Course outcomes (cont.)

CO	Description
G8.1	Show the understanding on security mechanisms used in DBMSs
G8.2	Apply security mechanisms to enforce the security policies in real-world information systems
G9.1	Show understanding on the way to store and retrieve data on storage devices
G9.2	Apply indexing structures for files properly and effectively in real-world information systems
G10.1	Show understanding on typical steps when processing (high-level) queries and algorithms used in query processing
G10.2	Describe query optimization techniques (using heuristic rules or selectivity and cost estimates)

Course outcomes (cont.)

CO	Description
G11.1	Conduct the implementation a database on SQL Server in real-world information systems based on functions provided by SQL Server
G11.2	Develop an application on a implemented database.

Contents

- Chapter 0 – Course Introduction
- Chapter 1 – Introduction to DBMSs
- Chapter 2 – Transaction processing and Concurrency control techniques
- Chapter 3 – Database recovery techniques – Database security and Authorization
- Chapter 4 – Data storage and query processing
- Chapter 5 – Algorithms for query processing and Optimization

Assessments

ID	Topic	Description	Ratio (%)
A1	Assignments		20
A11	Quizzes: QZ1, QZ2, QZ3, QZ4, QZ5, QZ6.	Quizzes in class for each topic	5
A12	Homework: HW1, HW2, HW3	HW1: Transaction design HW2: Concurrency control HW3: Authorization	5
Lab	Laboratory work: LW1, LW2, LW3	LW1: SQL, Transaction and stored procedure LW2: Authorization LW3: Concurrency control using provided lock modes, database backup and recovery, programming skills	10
A2	Projects		15
A21	Project PJ1	Perform the analysis, design and problem solving skills based on principles and functions provided by SQL Server in a real-world information system	15
A3	Exams		65
A31	Lab final exam	In-class programming exam on computer	20
A32	Midterm exam	Opened book exam. Apply some principles of RDBMSs	15
A33	Final exam	Opened book exam. Apply some principles of RDBMSs	30

Resources

- **Textbooks**
  1. Trần Đức Quang (dịch), Nguyên lý các hệ cơ sở dữ liệu và cơ sở tri thức (tập 2) (tác giả Jeffrey D. Ullman), Nhà xuất bản thống kê, 1999.
  2. Elmasri & Navathe, *Fundamentals of database systems,* Pearson Education Inc., 5th edition, 2004.
- **Reference books**
  3. H. Garcia-Molina, J. D. Ullman, J. Widom, *Database systems: The complete book*, Prentice Hall, 2002.
  4. A. Silberschatz, H. F.Korth, S. Sudarshan, *Database System Concepts*, McGraw-Hill, 2002.
  5. T. Connolly, C. Begg, *Database Systems*, Addison Wesley, 3rd edition, 2002.
- **Others**
  - Microsoft SQL Server (or Oracle, DB2)
  - Java, .NET

Regulations & Politics

- All students are responsible for reading and following strictly the regulations and policies of the school and university.
- Students who are absent for more than 3 theory sessions are not allowed to take the exams.
- For any kind of cheating and plagiarism, students will be graded 0 for the course. The incident is then submitted to the school and university for further review.