



VIETNAM NATIONAL UNIVERSITY OF HO CHI MINH CITY
UNIVERSITY OF NATURAL SCIENCES
FACULTY OF INFORMATION TECHNOLOGY

COURSE SYLLABUS

Course Code:	TH202
Title:	Database Management Systems
Credits:	4
Workload:	Lecture hours: 3 periods * 15 weeks = 45 periods Laboratory hours: 2 periods * 15 weeks = 30 periods
Prerequisites:	TH107 – Introduction to Database Systems

Course Objectives:

This subject gives students basic knowledge on Relational Database Management Systems (RDBMS): components and functions, concurrency control, security and recovery after crash, query optimization, internal data structure, and access methods. Implementation solutions on commercial DBMSs such as SQL-server, Oracle will be presented.

Main Text: N/A

References:

- *Principles of Database and Knowledge-Based systems*
Jeffrey D. Ullman - Computer science press,1988.
- *An Introduction to Database Systems*
C.J. Date. Addison Wesley – 8th edition, 2003.
- *Fundamentals of database systems*
Ramez Elmasri, Shamkant B. Navathe - Addison Wesley - 4th edition, 2003.
- *Base de données : les systèmes et leurs langages*
Georges Gardarin - Eyrolles,1994.

Course Outline:

Chapter 1 : Organization of a database management system (4 periods)

1. Development history of DBMS
2. Data storage in DBMS
3. Organization of a DBMS
4. Classification of DBMS

Chapter 2 : Concurrency control (16 lecture periods + 16 lab periods)

1. Introduction
2. Transaction

1. Definition
2. Characteristics
3. Some problems in concurrency control
 1. Lost update
 2. Unrepeated read
 3. Uncommitted dependency
4. Scheduling
 1. Concepts
 2. Serial schedule
 3. Serializable schedule
5. Locking
 1. Simple locking
 2. Read/Write lock
 3. Two-phase locking
 4. Locking in hierarchical data
6. Timestamp-based algorithms
 1. The concept of timestamp
 2. Full order algorithm
 3. Partial order algorithm
 4. Partial order algorithm with multi-version data
7. Other topics
8. Implementation in SQL-Server, Oracle.

Chapter 3 : Data security and recovery (12 lecture periods, 12 lab periods)

1. Data security
 1. Data security policies
 2. Data encoding
2. Data recovery
 1. Crash classification
 2. Recovery after transaction crash
 3. Recovery after system crash
 4. Recovery after hardware crash
3. Implementation in SQL-server, Oracle.

Chapter 4 : Storage and accessing methods (8 lecture periods)

1. Related components
 1. File manager
 2. Disk manager
 3. Physical organization
2. DBMS physical organization in SQL-server, Oracle.
3. Storage and accessing methods
 1. Serial file
 2. Index file
 3. Serial index file
 4. Hash

Chapter 5 : Query optimization (2 lecture periods, 2 lab periods)

1. Optimization policies
 1. Steps in query optimization
 2. Relational Algebra Tree based algorithm
 3. Decompose and replace algorithm
2. Cost estimation
3. Implementation of SELECTION and JOIN

Chapter 6 : Distributedl DBMS (3 lecture periods)

1. Client/Server models
 1. Concepts
 2. Some models
2. Distributed DBMS
 1. Characteristics
 2. Catalog Manager
 3. Concurrency control
 4. Query optimization

Grading

Final exam : 70%

Assignments: 30%