CSC 524 - DATABASE MANAGEMENT SYSTEMS -- ARCHITECTURE AND MANAGEMENT

CREDIT HOURS: 3
PREREQUISITES: CSC 425 or 520 or approval of computer science graduate advisor
GRADE REMINDER: Must have a grade of C or better in each prerequisite course.

CATALOG DESCRIPTION

Examination and appraisal of the fundamental technology of database management systems and of the practice of database systems design, database administration, and DBMS acquisition.

PURPOSE OF COURSE

Computer applications and information systems are evolving into database-centered rather than traditional file-oriented systems. Successful implementation and application of DBMS technology depend on understanding the architecture, economics, managements, and future directions of such systems. This course prepares students who will become acquisitioners, and maintainers of database installations. Emphasis is placed on DBMS design and construction from a systems perspective. This course complements the applications perspective of the DBMS course, CSC 425/520.

EDUCATIONAL OBJECTIVES

Upon successful completion of the course, students should be able to:

1. Demonstrate knowledge of the fundamental concepts of database technology.
2. Demonstrate knowledge of the techniques for managing the design, development, and maintenance of large database systems and data warehouses.
3. Describe the role and responsibilities of the database administrator.
4. Develop an understanding of management and social issues such as transaction management, database security, and privacy.
5. Develop an understanding of storage issues related to database administration.

CONTENT — Hours

Historical Development of DBMS Technologies 3

Relational, CODASYL, and Hierarchical Models 6

Externals (productivity and ease of use considerations) 15
- Performance Monitoring and Tuning
- Query Processing and Optimization
- Economics of Application Development
- Physical Database Design

Internal (Efficiency and Flexibility) 15
- Storage Structure
- Access Methods
- Storage Management

Concurrency Control
Failure Handling

Directions in Hardware and Software 3
Database Machines
Distributed Databases
The 4GL Environment

Exams 3

TOTAL 45

REFERENCES

Atre, Shaku, Database: Structured Techniques for Design, Performance, and Management, Wiley, 1988.

Cardenas, A.F., Data Base Management Systems, Allyn and Bacon, 1985.

Date, C. J., An Introduction to Database Systems, 8th Ed., Addison-Wesley, 2004.

Hawryszkiewycz, I.T., Database Analysis and Design, SRA, 1984.

McCullough-Dieter, Oracle9i Database Administrator: Implementation, & Administration, Course Technology Publishing, 2003.

Mullins, C., Database Administration, Addison-Wesley, 2002.

Shepherd, J.C., Database Management: Theory and Application, Irwin, 1990.

Wiederhold, Gio, Database Design, McGraw-Hill, 1983.