

CSCI 5324 - DATABASE MANAGEMENT SYSTEMS -- ARCHITECTURE AND MANAGEMENT

CREDIT HOURS: 3
PREREQUISITES: CSCI 4325 or 5320 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, CSCI 4325/5320.

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.

COURSE CALENDAR

This course meets for a minimum of 37.5 lecture contact hours during the semester. Students have significant assignments based on readings from the primary literature, participate in classroom discussions regarding current research topics, complete periodic homework and laboratory/programming assignments, and periodic exams in addition to the final exam. Students are expected to prepare for any class assignments or quizzes over the material covered in class or in the reading material. Successful completion of these activities requires at a minimum six additional hours of outside of classroom work each week.

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.

Hawryszkiewicz, 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.