Brooklyn College
Department of Computer & Information Sciences

CISC 7512 [*717.2X] Advanced Database Systems

37½ hours plus conference and independent work; 3 credits

Advanced aspects of database systems. Topics are chosen from such advanced topics as dimensional modeling, data warehouse design, data mining, XML integration, geographic information systems, and spatial and temporal data types

Objectives of the course:

1. Introduce advanced database topics.
2. Provide experience in the design and use of advanced database features.
3. Implement databases using advanced features.

Outcomes for the course:

The student will be able to:

1. Define a number of advanced database features.
2. Use advanced database features in designing and accessing databases.
3. Use appropriate advanced database features where indicated.

Course Outline:

Week 1 - Introduction, data warehouse concepts, business and technology drivers, data warehouse design

Week 2 - Data Warehouse Design, database SDLC, dimensional modeling primer

Week 3 - Using an ETL tool to build a data warehouse

Week 4 – Data mining, knowledge discovery: concept, process and techniques

Week 5 - Data mining, using one of the leading data mining products

Week 6 - XML and databases, introduction to semi-structured data and XML

Week 7 - XML integration with relational databases

Week 8 - Industry case study presentation

Week 9 – Midterm exam

Week 10 - New data types, Temporal and Spatial databases, concepts and architecture

Week 11 - Geographic information systems (GIS), how information is stored in a GIS

Week 12 – Implementing a GIS

Week 13 – Case study presentations

Week 14 – Case study presentations

Bibliography:

 Required Textbooks:

The Data Warehouse Toolkit: The Complete Guide to Dimensional Modeling (Second Edition) by Ralph Kimball, Margy Ross, Wiley, 2002.

Introducing Geographic Information Systems with ArcGIS by Michael Kennedy, Wiley, 2006.

 Other References:

Data Mining: Concepts and Techniques (Second Edition) by Jiawei Han and Micheline Kamber, Morgan Kaufmann Publishers, March 2006.

Database Management Systems (Third Edition) by Raghu Ramakrishnan and Johannes Gehrke, McGraw-Hill, 2003.

Fundamentals of Database Systems (Fifth Edition) by Ramez Elmasri, Shamkant B. Navathe, Addision-Wesley, 2007.

Oracle 9i by R.G. Freeman, Oracle Press, Osborne/McGraw Hill, 2001.

GIS: A Computing Perspective (Second Edition) by Michael Worboys, Matt Duckham, CRC Press, 2004.

GIS Basics by Stephen Wise, Taylor and Francis, 2002.

Database System Concepts (Fifth Edition) by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill, 2006.

Database Systems: The Complete Book, by Hector Garcia-Molina, Jeffrey D. Ullman, and Jennifer Widom, Prentice Hall, 2002.

Additional resources for documentation and software demo downloads
www.tdwi.org   http://www.w3.org/xml
www.oracle.com   www.sybase.com
www.microsoft.com   http://www.altova.com/products.html
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