School of Computing and Information Sciences

Course Title: Survey of Database Systems **Date:** 10/4/20

Course Number: COP 4722

Number of Credits: 3

Subject Area: Database	**Subject Area Coordinator:** Antonio Bajuelos **email:** abajuelo@fiu.edu
Catalog Description: Design & management of enterprise systems; concurrency techniques; distributed, object-oriented, spatial, and multimedia databases; database integration; datawarehousing & datamining; OLAP; XML interchange.	
Textbook: Fundamentals of Database Systems, 7th Edition Elmasri and Navathe Addison Wesley (ISBN: 0-13-397077-9)	
References:	
Prerequisites Courses: COP-4703 or COP-4710	
Corequisites Courses: None	

Type: Elective

Prerequisites Topics:

- Database architecture
- Design of SQL queries
- Distributed databases

Course Outcomes:

1. Exposure to enterprise database system
2. Master query optimization and concurrency techniques
3. Be familiar with object-oriented databases
4. Exposure to Spatial database and multimedia database
5. Familiarity with data mining, OLAP, and XML

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Outline

Topic	Number of Lecture Hours	Outcome
• Enterprise database systems o Enterprise server features o Enterprise server organization	2	1
• Query optimization o Translation of sql query to relational algebra o Efficient implementation of relational algebra operations o General query transformation rules o Query cost estimation, tuning queries o Semantic query optimization	6	2
• Concurrency o Transaction processing, ACID properties o Serializability, equivalence of schedules o Optmistic concurrency control o Locks, two-phase locking o Deadlock, time stamp ordering	6	2
• Object databases o Objects: atom, tuple, set; Literals o Persistent object and extents o Object Definition Language o Object Query Language o Sample ODB schema and OQL queries o Object relational databases	6	3
• XML and internet databases o XML hierarchical tree data model o XML documents, DTD, XSD o Importing/exporting XML documents o XML querying: Xpath, XQuery	6	5
• Datawarehousing and data mining o Data modeling for data warehouses o Building datawarehouses o Data mining – support and confidence o Association rules algorithms o Classification and clustering	6	5
• Emerging database technologies o Mobile databases o Multimedia databases o Spatial databases and GIS databases o Biological databases, temporal databases	4	4

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Course Outcomes Emphasized in Laboratory Projects / Assignments

	Outcome	Number of Weeks
1	Query optimization Outcome: 2	2
2	Serializability of schedules Outcomes: 2	2
3	XML data transfer Outcomes: 5	2
4	Data mining Outcomes: 5	2

Oral and Written Communication: No significant coverage

Number of written reports:

Approximate number of pages for each report:

Number of required oral presentations:

Approximate time for each presentation:

Social and Ethical Implications of Computing Topics

No significant coverage

Topic	Class time	Student performance measures

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Theoretical Contents

Topic	Class time
Relational algebra	0.5

Problem Analysis Experiences

1.	Analysis of data mining results to derive data patterns

Solution Design Experiences

1.	Design of an extended query processing algorithm
2.	Optimization of semantic query trees
3.	Construction of precedence graphs for schedules