School of Computing
UNIVERSITY OF GEORGIA

Course Information Sheet
CSCI 4370
Database Management

Brief Course Description (50-words or less)	The theory and practice of database management. Topics to be covered include efficient file access techniques, the relational data model as well as other data models, query languages, database design using entity-relationship diagrams and normalization theory, query optimization, and transaction processing.
Extended Course Description / Comments	This course provides the student with a comprehensive introduction to the design of databases and the use of database management systems for applications. It covers the relational model and, and SQL - the standard language for creating, querying, and modifying relational and object-relational databases. From a more theoretical perspective, it covers relational algebra, relational design principles based on functional dependencies and normal forms, and the entity relationship and object oriented approaches to database design. A variety of other issues important to database designers and users are covered, including indexes, views, transactions, and integrity constraints. Various indexing techniques and their advantages and disadvantages at certain situations are discussed. At different stages in the course, several practical topics such as using MySQL, programming in SQL, JDBC and other database tools are discussed. This course is part of the BS-CS Teamwork Requirement.
Pre-Requisites and/or Co-Requisites	Prerequisite: CSCI 2720 (Data Structures) OR CSCI 2725 (Data Structures for Data Science)
Required, Elective or Selected Elective	Selected Elective Course
Approved Textbooks (if more than one listed, the textbook used is up to the instructor's discretion)	Author(s): Kifer, Bernstein and Lewis Title: *Database Systems: An Application-Oriented Approach*, Complete Version Edition: 2nd Edition (2006) ISBN-13: 9780321268457
Specific Learning Outcomes (Performance Indicators)	This course presents a survey of topics in database management most relevant to students studying computer science or related fields. At the end of the semester, all students will be able to do the following: 1. Design a database by utilizing Entity Relationship (ER) or Unified Modeling Language (UML) diagrams. 2. Use database normalization. 3. Develop a relational database. 4. Describe and use a formal query language (Relational Algebra). 5. Produce database queries in a practical query language (SQL).

6. Implement and use indexing techniques.
7. Describe inner workings of a database system.
8. Develop database applications.
9. As a team, deliver a presentation of a functioning software system (that utilizes a database) that is designed, implemented, and tested by the team.

Relationship Between Student Outcomes and Learning Outcomes

	ABET Learning Outcomes						
Specific Learning Outcomes		A	B	C	D	E	F
	1	•					
	2	•					
	3		•			•	•
	4	•					
	5		•				
	6		•			•	•
	7	•					
	8		•		•	•	•
	9			•		•	

Major Topics Covered
(Approximate Course Hours)

3 credit hours = 37.5 contact hours
4 credit hours = 50 contact hours

Note: Exams count as a major topic covered

Overview of Databases and Transactions (3-hours)
The Big Picture (2-hours)
Relational Model (3-hours)
Relational Algebra (4-hours)
Physical Data Organization (3-hours)
Indexing (4-hours)
The Basics of Query Processing (3-hours)
An Overview of Query Optimization (2-hours)
SQL: Data Definition Language (DDL) (2-hours)
SQL: Query Language (QL) (4-hours)
JDBC (1-hour)
Conceptual Modeling (ER and UML) (1.5-hours)
Relational Normalization Theory (3-hours)
Transaction Processing (2-hours)

Course Master Dr. John Miller