The University of Georgia

Department of Computer Science

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

Use this section to put additional information that's relevant to whom this course is targeting

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.

Pre-Requisites and/or Co-Requisites

CSCI 2720
Data Structures

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.

Relationship Between Student Outcomes and Learning Outcomes

		Student Outcomes										
		a	b	c	d	e	f	g	h	i	j	k
Learning Outcomes	1		•				•			•	•	
	2	•	•							•	•	
	3	•	•	•	•			•		•		•
	4	•	•									•
	5	•	•	•						•	•	•
	6	•	•	•						•	•	•
	7		•	•							•	•
	8	•	•	•	•			•		•		•

Student Outcomes

a. An ability to apply knowledge of computing and mathematics appropriate to the discipline.
b. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
c. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
d. An ability to function effectively on teams to accomplish a common goal.
e. An understanding of professional, ethical, legal, security and social issues and responsibilities.
f. An ability to communicate effectively with a range of audiences.
g. An ability to analyze the local and global impact of computing on individuals, organizations, and society.
h. Recognition of the need for and an ability to engage in continuing professional development.
i. An ability to use current techniques, skills, and tools necessary for computing practice.
j. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
k. An ability to apply design and development principles in the construction of software systems of varying complexity.

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)

Assessment Plan for this Course

Each time this course is offered, the class is initially informed of the Course Outcomes listed in this document, and they are included in the syllabus. At the end of the semester, an anonymous survey is administered to the class where each student is asked to rate how well the outcome was achieved. The choices provided use a 5-point Likert scale containing the following options: Strongly agree, Agree, Neither agree or disagree, disagree, and strongly disagree. The results of the anonymous survey are tabulated and results returned to the instructor of the course.

The course instructor takes the results of the survey, combined with sample student responses to homework and final exam questions corresponding to course outcomes, and reports these results to the ABET committee. If necessary, the instructor also writes a recommendation to the ABET committee for better achieving the course outcomes the next time the course is offered.

How Data is Used to Assess Program Outcomes

Each course Learning Outcome, listed above, directly supports one or more of the Student Outcomes, as is listed in "Relationships between Learning Outcomes and Student Outcomes". For CSCI 4370, Student Outcomes (a), (b), (c), (d), (f), (g), (i), (j), and (k) are supported at different levels.

Course Master

Dr. Budak Arpinar

Course History

08/1998	Course Approved into CAPA
02/2012	Course Information Sheet Prepared