Course Syllabus

Department: Computing Sciences

Date: 9/2012

I. Course Prefix and Number: CSC 251

   Course Name: Applied Database Concepts

   Credit Hours and Contact Hours: 3 credit hours and 3 contact hours

   Catalog Description including pre- and co-requisites:
   An introduction to database design and development. Database normalization, data integrity, concurrent updates, and data security will also be discussed and practiced. Emphasis will be on using at least two popular database management systems to build and maintain relational databases. The student will create databases, queries, custom forms and reports. Additionally, SQL programming will be used extensively. Prerequisite: CSC 115 with a “C” or better.

II. Course Outcomes and Objectives

   Student Learning Outcomes:
   Upon completion of the course the participant will be able to:
   1. Define and use common databases terminology.
   2. Determine how data are organized using a database.
   3. Identify data that are suitable and unsuitable for databases.
   4. Normalize Tables
   5. Design (using ERD’s) and build databases
   6. Access and Manipulate Data in databases
   7. Code Queries and other customization routines using SQL and QBE
   8. Develop customized entry screens and reports
   9. Identify the policies of database administration

   Relationship to Academic Programs and Curriculum:

   This course is required in the AS Information Systems degree program and in the AAS Information Technology (Web and Multimedia Application Development advisement area) degree program. AS Computer Science majors can take this as an elective.

   College Learning Outcomes Addressed by the Course:
   □ writing  ☒ computer literacy
   ☒ oral communications  □ ethics/values
   ☒ reading  ☒ citizenship
   □ mathematics  □ global concerns
   ☒ critical thinking  ☒ information resources

III. Instructional Materials and Methods
Types of Course Materials:

Textbook and online resources.

Methods of Instruction (e.g. Lecture, Lab, Seminar …):
The instructor will employ a number of techniques to facilitate a thorough learning experience. Specifically, they will be: lecture of underlying concepts and theories, instructor demonstration, and guided student activities in the microcomputer environment.

IV. Assessment Measures (Summarize how the college and student learning outcomes will be assessed):
1. Case Problems in database design:
   “Real world” simulation cases will assess skills in critical thinking, computer literacy, and information resources.
2. Online text tests:
   Current online chapter tests will assess student’s computer literacy and test the student’s ability to read and comprehend the course materials. The tests will measure the student’s comprehension of the course concepts as related to database design and development.
3. Final Presentation:
   A culminating final project where the student will be designing and developing a database and the oral presentation of this to the class will assess the communication outcome.

V. General Outline of Topics Covered:
Course Outline
1. Define and use common database terminology.
   a. Background
   b. History of Database Management
   c. Advantages and disadvantages of Database Processing
   d. Data, Storage, Retrieval, and Update
   e. Shared Update
   f. Backup and Recovery
   g. Security
   h. Integrity
   i. Data Independence
   j. Replication
   k. Utilities

2. Determine how data are organized and manipulated using a database.
   a. Relational Databases
   b. The Relational Algebra
   c. Hierarchical Databases
   d. Network Databases

3. Identify data that are suitable and unsuitable for databases.
   a. Distributed Databases
   b. Client/Server Systems
   c. Data Warehouses
   d. Object-Oriented Databases Management System
   e. The Internet and Intranets
4. Normalize Tables
   a. Functional Dependence
   b. Keys (Primary, Foreign and Secondary Keys)
   c. First Normal Form, 2\textsuperscript{nd}, 3\textsuperscript{rd} normal forms
   d. Incorrect Decompositions
   e. Multivalued Dependencies and Fourth Normal Form
   f. Avoiding the Anomalies Problem

5. Design and build databases.
   a. Information-Level Design
      i. The Methodology
      ii. Databases Design Examples
      iii. Identify Relationships