1. Title of the Course, Course Number and Credits:

Title: “Data Management Concepts and Applications”
Course Number: CS 355
Credits: 3 credits

2. Description of the Course:

This course provides an overview of data organization, data management, and data manipulation by applications. It will explore the enterprise perspective of managing data. The students will learn data integrity, data models, security, database integration, and various database administration issues. A significant data management project in query processing within a database environment will be included in the course.

3. Course Prerequisites:

CS 255 Foundations of Information Systems

4. Course Objectives:

The main objective of this course is to learn the various principles of data management and its applications with an emphasis on the following:

- Learn the importance of data and information in an organization;
- Understand the organization and distribution of data in an enterprise;
- Be familiar with systems concept, system development, and understand data management issues;
- Study the different data models, including entity-relationship model, relational model, object-oriented model, and object-relational model;
- Be able to define, manipulate, and access data in a database environment;
- Learn various issues in data administration such as integrity, privacy, and security;
- To gain experience in developing a data management project.

5. Student Learning Outcome:

Upon completion of the course, students will be able to:

- Appreciate data as an important resource for an organization;
- Gain the general concepts of data management and its relationship to the structure of an organization;
- Obtain the knowledge of enterprise data architecture and the roles of information systems, databases, data warehouses, OLAP tools, and applications;
- Describe the creation and use of metadata and data dictionary;
- Capture data requirements and specifications in entity-relationship model and
UML;
• Compare the different data models of relational model, object-oriented model, and object-relational model;
• Design, develop, and execute SQL;
• Understand the organizational perspective of data administration such as efficiency, integrity, privacy, security, ethical responsibility, tactical and strategic advantages.
• Effectively express themselves in written and oral form by presenting the database design to the class and also in a written report;
• Demonstrate ability to think critically and logically in data management by analyzing the data and information collected, develop methodology to design and implement the database which will function correctly and efficiently;
• Locate and use information in the process of solving problems; extensive article search will be required to augment class work in problem solving process
• Demonstrate the ability to integrate knowledge and ideas in a coherent and meaningful manner; students will be assigned to work as a team in database design and analysis by working on actual case studies
• Improve computer skills by using a Data Base Management System (DBMS) and a query language (SQL).

6. **Topical Outline of the Course Content:**

Topics covered in the course will be taken from but not necessarily limited to the following:
• Data organization and information management;
• E-commerce, World Wide Web, information systems, and their roles in an organization;
• Enterprise data architecture;
• File and database management;
• Introduction to data models and data abstraction;
• Data dictionary and metadata concepts;
• Entity-relationship model and UML (Unified Modeling Language);
• Relational model and relational algebra;
• Introduction to data normalization and functional dependency;
• Database applications and Structured Query Language (SQL);
• Privacy and security;
• Database administration;
• Introduction to data warehouses and on-line analytical processing (OLAP);
• Object-oriented and object-relational database concepts.

7. **Guidelines/Suggestions for Teaching Methods and Student Learning Activities:**

• Classroom lectures, presentations (Blackboard Course Management system), and discussions;
• Problem solving sessions and class exercises;
• Homework, project, and pre-examination reviews;
• Oral presentations of project.

8. Guidelines/Suggestions for Methods of Student Assessment (Student Learning Outcome):

• Reading Assignments:
  Read relevant course materials before the lecture of the topic is highly recommended.
• Tentative timeline for submission of written assignment or other work:
  All projects and homework will be collected as scheduled. Copying someone else’s work is not acceptable and will be penalized according to university’s policy.
• Examinations (tentative dates, make-up policy, etc.):
  Examination schedule will be published in the syllabus. All exams will be announced at least one full week in advance if changes in dates are necessary.
  If you are absent on the day an exam is announced, you are responsible for finding out about it from a fellow student or the professor. No make-up exams will be given except for extraordinary circumstances.
• Class participation:
  Bring lecture notes to each class (highly recommended).
  Read relevant text before class to optimize productivity.

9. Suggested Readings, Text, and Other Relevant Materials:

Two Required Texts:


10. References:


11. Preparer Name and Date:

Dr. Cyril S. Ku (Assistant Professor) March 7, 2006

12. Original Departmental Approval Date:

March 7, 2006

13. Reviser’s Name and Date:

NA

14. Department Revision Approval Date:

NA