CONCEPTS OF COMPUTER SCIENCE

MATH 502

Course Description

This course provides an historic overview and survey of equipment and other elements to be found in computer systems. The operations and management of computer resources, use of math software, and an overview of computer programming languages are other topics covered.

Course Goals

1. Introduce components and operation of a computer.
2. Input and output devices of a computer.
3. Distinguish between different types of memory and data storage.
4. Introduce and discuss differences between command line and graphically based operating systems.
5. Windows and its four major characteristics.
6. Introduction to basic word processing.
7. What is a database and how is it constructed?
8. Sharing information between software applications.
9. Introduction to the basics of C++ programming.
10. Introduction to the concepts of decision and repetition in a programming language.

Instructional Procedures

1. Lecture covering theory and areas of application.
2. Assigned reading and homework.
3. In-class hands on computer mini-lessons.
4. Assigned computer projects applying course matter.

Course Content

A. Introduction to Computers
   1. What is hardware?
   2. Basic components of a computer.
   3. Computer memory.
   4. Computer peripherals.
   5. What is software?

B.   Operating Systems
   1. DOS
   2. What is Windows?
   3. Advantages of Windows
   4. Windows Desktop and User Interface

C. Software Applications
   1. Word Processing
   2. Computer Databases
   3. Databases and Word Processing
   4. The electronic spreadsheet

D. Introduction to Programming
   1. The C++ programming language.
   2. Data values and arithmetic operations.
   3. Variables and declaration statements.
   4. Input and output and C++
   5. Simple C++ programs

E. Selection Structures
   1. If-then
   2. If-then-else
   3. Nested statements

F. Repetition Structures
   1. While loops
   2. Interactive while loops
   3. For loops
   4. Do while loops

Evaluation Measures

   1. Periodic quizzes and tests.
   2. In-class mini-projects
   3. Programming projects
   4. Final Examination
   5. Notebook

Bibliography

   A. Required Text
       None

   B. Additional Required Readings
       None

C. Supporting Bibliography

Allen, Mark, <u>Algorithms, Data Structures, & Problem Solving with C++</u>, Addison Wesley, 1996.

Bronson, Gary J., <u>Program Development and Design</u>, PWS-Kent Publishing Co., 1997.

Bucki, Lisa, & Brown, Rick, <u>The Big Basics Book of PC's</u>, Que Books, 1997.

Cornerstone Solutions, <u>Introduction to PC/DOS</u>, 1993.

Cornerstone Solutions, <u>Introduction to Windows</u>, 1994.

Kraynak, Joe, <u>10 Minute Guide to PC Computing</u>, Que Books, 1997.

Lee, P., <u>The Apprentice C++ Program</u>, Wadsworth, 1996.

Overland, Brian, <u>C++ in Plain English</u>, MIS Press, 1996.

Person, Ron, <u>Using Windows</u>, Que Books, 1994.

D. Relevant Software

1. Microsoft Access
2. Microsoft Excel
3. Microsoft Word
4. C++ Programming