

I. CATALOG DESCRIPTION:

- A. Departmental Information:
Division: Science and Math
Department: Computer Science
Course ID: CS 110
Course Title: Fundamentals of Computer Science
Units: 3
Lecture: 2 hours
Laboratory: 3 hours
Prerequisite: MATH 095
- B. Catalog and Schedule Description: An orientation in computer science for computer science majors. Topics include an overview of the computer discipline, the design and use of the computer devices, the art of problem solving and programming, and the representation of data. Includes hands-on experience in computer programming using languages such as Visual Basic.NET and C++.

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One

III. EXPECTED OUTCOMES FOR STUDENTS:

Upon completion of the course, the student should be able to:

- A. Identify the basic components of a computer system.
- B. Distinguish data from information.
- C. List various types of application software and system software.
- D. Describe how programming instructions are executed by a computer.
- E. Describe how the binary number system is used for internal representation.
- F. Convert numbers in binary, octal, and hexadecimal number systems.
- G. Differentiate among different kinds of I/O devices.
- H. Differentiate among different kinds of memory devices.
- I. Analyze problems for programming with flowcharts and pseudocodes.
- J. Define the I/O process and plan a solution for a programming problem.
- K. List the different levels of programming languages.
- L. Read and write simple programs in Visual Basic.NET.
- M. Read and write simple programs in common languages such as C++.
- N. Compare and contrast codes in programming languages.
- O. Describe and compare different methods in data communications.
- P. Search and retrieve information in the Internet.
- Q. Recognize the problems of security and privacy with computer networks.
- R. Use productivity software for simple tasks.
- S. Distinguish and use DOS and Windows for the PC.
- T. List and describe the phases of systems analysis and design.
- U. Understand how people and events affected the development of computers.

IV. CONTENT:

- A. Introduction to computers
 - 1. Computers and society
 - 2. A computer system: hardware and software
- B. Computer hardware
 - 1. The development of the computer industry
 - 2. Computer architecture
 - a. Number systems and internal representations
 - b. Binary, octal, and hexadecimal numbers
 - 3. The input/output system
 - 4. Storage devices
 - 5. Communication systems

- C. Computer software
 - 1. Programming
 - a. Flowcharts and pseudocodes
 - b. Problem solving and structure techniques
 - c. Steps of writing a program
 - 2. Programming languages
 - a. The development of languages
 - b. Using Visual BASIC
 - c. Using C++
 - 3. Operating systems
 - 4. System analysis
 - 5. Management information systems
- D. Applications and issues
 - 1. Word processing and desktop publishing
 - 2. Spreadsheets and graphics
 - 3. Database Management
 - 4. Security, privacy, and ethics
- E. Tools of today and tomorrow
 - 1. Artificial intelligence, expert systems, and robotics
 - 2. Multimedia and virtual reality
 - 3. Networks
 - a. Internet tools
 - b. World Wide Web
 - 4. Computer careers

V. METHODS OF INSTRUCTION:

- A. Lecture
- B. Discussion, either in-class or on-line
- C. Multi-media
- D. On-line presentations
- E. Projects
- F. Examinations

VI. TYPICAL ASSIGNMENTS:

- A. Read Chapter 3 and summarize your understanding of loop structures in paragraph form.
- B. Analyze the following program and deduce the algorithm used.
- C. Write a C++ program to compute the final amount of an investment if the interest is compounded quarterly instead of annually.
- D. Discuss current events relating to computers either on-line or in the classroom.

VII. EVALUATION(S):

- A. Programming projects
 - One project per week
- B. Examinations and quizzes
 - Two exams: midterm and final
 - Weekly quizzes on reading assignments either in class or on-line

VIII. TYPICAL TEXT(S):

- A. Computers: Tools for an Information Age, Capron, H. L., Addison-Wesley, 2005.
- B. Discovering Computers 2004: A Gateway to Information. Shelly, Cashman, & Vermaat, Thomson, 2004.

IX. OTHER SUPPLIES REQUIRED OF STUDENTS: None.