Syllabus
Department of Mathematics and Computer Science
CSC 120: Problem Solving and Programming Constructs

A. Protocol

Course Name: Problem Solving and Programming Constructs
Course Number: CSC 120
Credits: 3
Prerequisites: High School Algebra or Equivalent

Upon entering this course the student will be able to:

a) Understand algebraic notation.
b) Perform algebraic manipulation.
c) Perform mathematical operations.
d) Perform relational operations.
e) Use a microcomputer running a Windows operating system.

Date of Revision: Spring 2005

B. Objectives of the Course

Upon completion of this course the student will be able to:

a) Apply problem solving techniques.
b) Discuss data types, file types, constants and variables.
c) Use the various mathematical, logical and relational operators.
d) Construct statements (assignments, expressions and functions).
e) Perform program design techniques (flowcharts and pseudo-code).
f) Use programming constructs (repetition, selection and sequencing).
g) Discuss data structures (arrays and linked lists).
h) Design, write, run and debug introductory C programs.
i) Work in collaborative groups.

C. Catalog Description

This course will provide the student with a basic literacy of computers, present problem solving heuristics and structured programming techniques, present language independent data types, operations, programming constructs and statements, introduce arrays and linked lists, and implement fundamental programs using an appropriate programming language. Prerequisite: High School Algebra or Equivalent. Three credits.

D. Outline of the Course

a) Introduction to Problem Solving ..... 9 hrs
   i) Problem solving strategies
   ii) Problem identification
   iii) Problem understanding
   iv) Algorithm development
   v) Solution planning (flowcharts, pseudo-code, etc.)
   vi) Modular programming design

b) Programming Concepts ..... 18 hrs
   i) Constants and variables
   ii) Variable types
      (1) Local

(2) Global

iii) Data and file types
   (1) Numerical
   (2) Character
   (3) Logical
   (4) Sequential files
   (5) Random access files

iv) Operators
   (1) Mathematical
   (2) Logical
   (3) Relational
   (4) Tables (truth tables, etc.)

v) Statements
   (1) Assignments
   (2) Expressions
   (3) Functions

vi) Programming constructs
   (1) Sequencing
   (2) Selection
   (3) Looping
   (4) Recursion

vii) Arrays
   (1) One dimensional
   (2) Two dimensional
   (3) Multidimensional
   (4) Data manipulation
      (a) Data entry
      (b) Sorting
      (c) Searching
      (d) Data output

viii) Linked list concepts

c) Programming in the Presently Adopted Language (Fall 1992 "C").....15 hrs
[The following topics are to be integrated throughout the course, as appropriate.]

i) Header files and include statements
ii) C syntax (punctuation, braces, etc.)
iii) Data types (integer types)
iv) Input/Output
   (1) Scanf
   (2) Printf

v) Sequential
   (1) Assignments
   (2) Expressions
   (3) Library functions (math functions, character functions)

vi) Selection
   (1) if..then..else
   (2) switch, case

vii) Iteration
   (1) While
   (2) For
   (3) Do/while

viii) Compiling
ix) Linking
x) Running
xi) Debugging

E. Teaching Methodology

This course will be taught using the lecture/discussion method and cooperative group method during appropriate sections of the course.

F. Assessment Activities

The final grade will be determined as a percentage from the following evaluation methods with varying weights at the discretion of the instructor:

a) Examinations
b) Quizzes
c) Assignments
d) Programs
e) Attendance
f) Performance

G. Accommodations for Students with Disabilities

Students with disabilities:
- Reserve the right to decide when to self-identify.
- Must register with the Office for Students with Disabilities (OSD) to receive services.
- Will provide the appropriate notice from OSD for accommodations which specifically involve the faculty.

Students with disabilities receive services from the Office for Students with Disabilities (OSD). The OSD is located in the Azorsky Building, Room 105. The phone number is (724) 938-5781. Requests for accommodations should be directed to this office and require the student to submit a completed Accommodation Request Form. Approved accommodations will be recorded on the Accommodation Approval Notice and provided to the student.