SYRACUSE UNIVERSITY
L.C. SMITH COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

ECS 102 – Introduction to Computing

Catalog Description
Computing concepts. Principles of programming. Applications of computing concepts to problem solving in engineering and computer science. Laboratory topics will include problem solving projects from various disciplines within the college.

Course Objectives
To develop good programming skills and to develop problem solving skills via C-programming language.

Prerequisites
None, this is a first year course.

Course Outcomes
At the completion of the course, the student should be able to do the following:

- Clearly formulate a program’s requirements [ABET (a, b, c, i, k)].
- Develop an algorithm for solving a problem [ABET (a, b, c, j)].
- Identify functions for solution of a problem, and identify and classify the parameters [ABET (b, c)].
- Write a C program [ABET (c, i)].
- Build sets of test data in order to evaluate computer programs [ABET (b, c, k)].
- Thoroughly test a program. [ABET (c, i, k)]
- Debug a program.[ABET (i, k)]
- Understand the organization of a computer system. [ABET (c)]
- Understand the process of compiling, linking, and running a program [ABET (i)]

Outcome Measurement
Course outcomes will be measured via in-class exams and reports. Every student is required to submit 3 written reports for their term project (Report 1-Problem Description (1-3 pages), Report 2-Problem analysis and Algorithm Design (2-5 pages), Final Report (at least 3 pages).

Course Topics
Programming language topics: data types, input/output, files, operations, logical expressions, selection, repetition, functions, arrays, strings, recursion, structures. Laboratory Projects: Lab 1: Writing and following directions Lab 2: Writing and running a program with Visual Studio.net Lab 3: Prime Stepping through a program Lab 4: arithmetic with int and double, and the software development method Lab 5: built in functions, and functions.c for the lab Lab 6: writing a program with functions (no parameters, no return value) Lab 7: working with parameters and return values of functions Lab 8: if, if ... else, if...else if Lab 9: functions can call other functions Lab 10: how to play the odds Lab 11: intro to loops Lab 12: more loops Lab 13: reading and writing to files, finding the biggest element in a list, using a sentinel, Data file: Jan05temps.txt Lab 14: nested loops, looping through characters,
switch statements Lab 15: arrays, output parameters
Lab 16: Using rand() and arrays as counters
Lab 17: Output parameters
Lab 18: Introduction to Strings
Lab 19: 2-dimensional arrays, photo processing
Lab 20: Screen Buffers and Parallel arrays
Lab 21: strings: gets, fgets, strcmp, strcpy, arrays of strings.
Lab 22: sorting, shuffling, EOF
Lab 23: return value of fgets, strcmp practice, sorting a list of strings
Lab 24: Recursion
Lab 25: allocation on the free store (heap)
Lab 26: binary search
Term project (whole semester): problem description, analysis, algorithm design, algorithm implementation in C, testing, demonstration, technical report.

CAC Category Content
1 Data Structures
0 Algorithms
1 Software Design
0 Computer Organization & Architecture
1 Programming Languages