**COLLIN COUNTY COMMUNITY COLLEGE DISTRICT**

**COURSE SYLLABUS**

Course Information

**Course Number**: COSC 1420

**Course Title**: C Programming

**Course Description:** Introduces the fundamental concepts of structured programming in the C language. Topics include data types; control structures; functions, structures, arrays, pointers, pointer arithmetic, unions, and files; the mechanics of running, testing, and debugging programs; introduction to programming; and introduction to the historical and social context of computing. Additionally, this course assumes computer literacy.

**Course Credit Hours**: 4

**Lecture Hours**: 4

**Prerequisite**: MATH 1314 or equivalent academic preparation

**Student Learning Outcomes**:

* **State-mandated Outcomes:** Upon successful completion of this course, students will:

1. Analyze and explain the behavior of simple programs involving the fundamental programming constructs
2. Modify and expand short programs that use standard conditional and iterative control structures and functions; choose appropriate conditional and iteration constructs for a given programming task.
3. Design, implement, test, and debug a program that uses each of the following fundamental programming constructs: basic computation, simple I/O, standard conditional and iterative structures, and the definition of functions.
4. Apply the techniques of structured (functional) decomposition to break a program into smaller pieces.
5. Describe the mechanics of parameter passing and demonstrate the difference between call-by-value and call-by-reference parameter passing.
6. Discuss the importance of algorithms in the problem-solving process, identify the necessary properties of good algorithms, and create algorithms for solving simple problems.
7. Use pseudocode or a programming language to implement, test, and debug algorithms for solving simple problems.
8. Discuss the representation and use of primitive data types and built-in data structures.
9. Explain the reasons for using different formats to represent numerical data.
10. Explain basic concepts of secure programming functions.
11. Discuss the properties of good software design.
12. Describe the phases of program translation from source code to executable code and the files produced by these phases; explain the software life cycle and its phases, including the deliverables that are produced.
13. Identify and describe the properties of a variable such as its associated address, value, scope, persistence, and size.
14. Explain how abstraction mechanisms support the creation of reusable software components.

* **Additional Collin Outcomes:**

1.0 Demonstrate Competency in Structured Programming.

1.1 Divide a program into functions and use the various storage classes of variables.

1.2 Design, code and document a term programming project.

2.0 Demonstrate Competency in Program Documentation.

2.1 Construct a program heading and use program comments.

* 1. Print out a source listing.

3.0 Demonstrate Competency in Algorithm Development.

3.1 Complete all programming assignments.

4.0 Demonstrate Competency in Program Code Production.

4.1 Explain the purpose of preprocessing directives.

4.2 Explain the precedence and associativity of operators.

4.3 Code the logical control structures (sequence, selection and iteration).

* 1. Perform special input/output functions.

4.5 Run a program using redirection of input and output.

4.6 Define and manipulate one-dimensional and multidimensional arrays.

* 1. Decide whether a two-dimensional array or a parallel array is best suited to store a given set of data in a program.
  2. Demonstrate knowledge of the relationship between arrays and pointers by coding a particular program first using arrays and then pointers.
  3. Use the various string handling functions.
  4. Declare and utilize a C structure.

4.11 Read and write to sequential data files.

5.0 Demonstrate Competency in Advanced Programming Techniques.

5.1 Use the C preprocessor.

5.2 Understand memory management and dynamic allocation.

5.3 Design, code, and debug a semester programming project.

**Withdrawal Policy:** See the current *“Collin Registration Guide”* for the last day to withdraw.

**Collin College Academic Policies:** See the current *“Collin Student Handbook.”*

**Americans with Disabilities Act:** Collin College will adhere to all applicable federal, state and local laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal opportunity. It is the student’s responsibility to contact the ACCESS office, SCC-D140 or 972.881.5898 (V/TTD: 972.881.5950) to arrange for appropriate accommodations. See the current *Collin Student Handbook* for additional information.

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