North Polk Community Schools Pacing & Course Description Guide

Grade Level: 9-12	Content: COMPUTER PROGRAMMING 2	Year: 2022-2023

Course Description/Rationale

Prerequisite: Computational Science
C++ language will be studied. Sorting techniques, files, and graphing will be used. The student will be required to write a large program in the C++ language. (1 HS credit

Name of Unit	Time Frame	Essential Learning Target	Standard(s)
Overview of C++	Week 1	To understand what a computer program is. To understand what an algorithm is. To learn what a high-level programming language is.	3B-AP-15Analyze a large-scale computational problem and identify generalizable patterns that can be applied to a solution.
Syntax and Semantics	Week 2-3	To understand how a C++ program is composed of one or more subprograms (functions). To understand the concept of a data type. To learn the steps involved in entering and running a program.	3B-AP-11 Evaluate algorithms in terms of their efficiency, correctness, and clarity.
Numeric Types, Expressions, and Output	Week 3-5	Understand and use strings(four functions that operate on strings: **length**, **size**, **find**, and **substr**.) in a C++ program. When using the **/** and **%** operators, remember that division by zero is not allowed. For every library function you use in your program, be sure to **#include** the appropriate header file.	3B-DA-06 Select data collection tools and techniques to generate data sets that support a claim or communicate information.
Input and Output	Week 4-6	Construct input statements to read values into a program.	3B-AP-11

		Determine the contents of variables assigned values by input statements. Write programs that use data files for input and output. Apply the functional decomposition methodology to solve a simple problem.	Evaluate algorithms in terms of their efficiency, correctness, and clarity.
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Control Structures	Week 5-7	To understand how the Boolean operators work. To understand the flow of control in a branching statement. To understand the flow of control in a nested branching statement.	3B-AP-10 Use and adapt classic algorithms to solve computational problems.
Looping	Week 6-8	To understand the flow of control in a loop. To understand the differences between count-controlled, event-controlled, and flag-controlled loops. To understand counting and summing operations within a loop. To know how to choose the correct type of loop for a given problem	3B-DA-06 Select data collection tools and techniques to generate data sets that support a claim or communicate information.
Functions	Week 9-11	To know how functions can be used to reflect the structure of a functional decomposition. To understand the difference between value and reference parameters. To know how to use arguments and parameters.	3B-DA-06 Select data collection tools and techniques to generate data sets that support

			a claim or communicate information.
Scope, Lifetime and More with Functions	Week 10-12	To know what a global reference is. To understand and be able to avoid unwanted side effects. To know when to use a value-returning function.	3B-AP-15Analyze a large-scale computational problem and identify generalizable patterns that can be applied to a solution.
Arrays	Week 11-13	To understand the structure of a one-dimensional array. To know how to use a one-dimensional array in solving a problem.	3B-AP-15Analyze a large-scale computational problem and identify generalizable patterns that can be applied to a solution
ITEC Project	Week 12-15	Working on a large Project with a maximum of three in a group	3B-AP-15Analyze a large-scale computational problem and identify generalizable patterns that can be applied to a solution.
Intro to Java	Week 14-18	I can see the relationship between C++ and Java.	3B-DA-06 Select data collection tools and techniques to generate data sets that support a claim or communicate information.

