Republic of the Philippines
DEPARTMENT OF SCIENCE AND TECHNOLOGY
PHILIPPINE SCIENCE HIGH SCHOOL
MAIN CAMPUS

COMPUTER SCIENCE UNIT

Computer Science 2: Introduction to Computational Thinking
AY 2024-2025

Number of meetings per week: 2 (one 45-minutes session, one 90-minutes session)
Credit unit: 1.0

Course Description:

The course is an introduction to computational thinking. The students learn and are trained to develop solutions using computers for real-life applications. The focus is on developing logic formulation skills through pseudocode, flowcharting, and procedural or structured programming using a C++ programming language.

Note:

- *Following the PSHS System set CS2 Curriculum Under Remote and Blended Learning of AY 2020-2021 using the C++ programming language.*

General Course Objectives:

1. Understand fundamental techniques of solving computer programming problems through algorithms.
2. Know the different paradigms of computing.
3. Design solutions to programming problems using pseudocode and / or flowchart.
4. Understand and apply different programming elements which are necessary for programming.
5. Identify and implement appropriate programming structure for each programming problem.
6. Create programs as solutions to practical problems.
7. Develop collaborative skills through peer consultations on assigned programming exercises.
8. Learn good programming practices as applied in the field and demonstrate positive attitude from constructive criticisms of their programming solution.
9. Use information and communications technology tools to aid and reinforce learning, like: electronic mail, online learning tools, social networking, integrated development environment, etc.
10. Reinforce good ethical behavior by emphasizing acceptable norms to using proprietary and / or freeware software and complying to license agreements and respecting copyrights.

Major Course Topics at a Glance:

1. Introduction to Programming
2. Introduction to a Programming Language
3. Programming Basics
4. Logical Control Structures
5. Arrays
6. Functions

Course Outline:

First Quarter

1. Introduction to Programming
   a) Programming Ethics
   b) Programs, Programming Languages and Compilers

2. Introduction to a Programming Language
   a) Sample Program and Layout of a Program
   b) Compiling and Running a Program

3. Programming Basics
   a) Constants and Variables
   b) Rules for Naming a Variable
   c) Declaring a Memory Location
   d) Coding Conventions
   e) Accepting and Displaying Data
      - Input Statement
      - Output Statement
   f) Terms Definition
   g) Operators and Expressions
      - Operators, Expressions (Arithmetic)
      - Operators, Expressions (Relational)
      - Precedence Rules

Second Quarter

1. Logical Control Structures
   a) Sequential
   b) Selection / Decision
      - if-else statement
      - if statement
   c) Nested Decisions
      - Nested if-else statements
      - Multiway if-else statements (if-else chain)
      - switch statement
   d) Iteration / Loop
      - Counter controlled
      - Event controlled

Third Quarter

1. Iteration / Loop
   a) Pre and Post-test condition
   b) Nested loop structures

2. Arrays
   a) Declaration
   b) Initialization
   c) Referencing
   d) Traversing
   e) Practical Applications

Fourth Quarter

1. Functions
   a) Purpose of functions
   b) Prototypes, definitions, and calls
   c) Function parameters
   d) Using *return* statement, Functions in expressions
   e) Predefined functions

Assessments:

- Formative Assessments
- Machine Problems

Grading System:

First Quarter to Fourth Quarter Grading Periods (Qtr1 to Qtr4)		
	Frequency / quarter	**Weight (%)**
Formative Assessment	weekly, at least four (4)	50
Machine Problem	one (1)	50
	Total:	100

Quarter N performance = (FORMATIVE_ASSESSMENTS$_{AVERAGE}$ * 0.50) + (MP * 0.50)

Formative Assessment

Purpose. Designed that can be taken in at most thirty (30) minutes, which will provide both learners and teacher immediate feedback on the learner's understanding level of previously discussed programming concepts.

Administration. Formative assessment will be administered weekly (the assessment can be in the form of a classic objective type online or paper and pencil test, a coding problem, etc.).

How an actual formative assessment performance will be recorded. The CS2 teachers will be following the "seventy percent of actual formative assessment performance plus thirty percent compliance" policy.

Recorded Score = (Actual Performance * 0.70) + (Total Assessment Points * 0.30)

Any assigned formative assessment not taken due to unexcused absence will be recorded as zero (0).

Machine Problem

Purpose. Each of the academic quarter's machine problem will be designed to assess a learner's ability to apply concepts learned in the quarter (and in the previous quarters), analyze the different elements of programming learned, evaluate the operations, instructions, and logic control structures to use in designing the algorithm, and finally, create an algorithm that represent a solution to the assigned computational problem.

Level of challenge and date of assessment administration. The assigned machine problem in any academic quarter can be accomplished by the learners in at most 75 minutes: design, implementation, testing and/or debugging, (student perspective). The assessment will be administered in the last double period session of the grading period.

Rubrics. Rubrics to rate the quality of work output (in the form of a source code) turned-in for an assigned machine problem will be explained by your subject teacher on Week 3 or 4 of the first quarter grading period (when the basics of programming will be discussed in the class).

Honor Code / Honor Integrity

We subscribe to honest and responsible scholarship. Thus we will uphold the PSHS core values of Integrity, Excellence, Service.

Time Reference

For common time reference (for purposes of accessing the scheduled online exams, submitting an output for an assigned requirement with set due date and time, class time matters, etc.) make sure that the computing device(s) you are using is set using internet or network time (time zone: GMT +8) or Philippine Standard Time.

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