PRECISION EXAMS by youscience

Computer Programming I

EXAM INFORMATION

Exam Number

820

Items

40

Points

45

Prerequisites

NONE

Recommended Course Length

ONE SEMESTER

National Career Cluster

HUMAN SERVICES

Performance Standards

INCLUDED (OPTIONAL)

Certificate Available

YES

DESCRIPTION

An introductory course in program engineering and applications. The course introduces students to the fundamentals of computer programming. Students will learn to design, code, and test their own programs while applying mathematical concepts. Teachers introduce coding concepts and problem-solving skills to beginning students through a programming language such as C++, C#, Java, Python, or JavaScript. Students will also be introduced to more complex data structures and their uses, including arrays and classes. Students will learn to create more powerful programs.

EXAM BLUEPRINT

STANDARD	PERCENTAGE OF EXAM
1. Programming Language IDE	11%
2. Program Development Methodology	13%
3. Commands and Operations	36%
4. Control and Loop Structures	33%
5. Career Opportunities and Ethics	7%

STANDARD 1

Students will be familiar with and use a programming language IDE (Integrated Development Environment)

Objective 1 Demonstrate concept knowledge of different languages.

1. Describe the difference between an interpreted language vs a compiled language. • Identify characteristics of high-level and low-level languages.

Objective 2 Demonstrate the ability to use an IDE.

1. Use an IDE to develop, compile, and run programs.
2. Understand the difference between syntax, run-time, and logic errors.
3. Use the debugger to identify errors.

Standard 1 Performance Evaluation included below (Optional)

STANDARD 2

Students will understand program development methodology

Objective 1 Demonstrate the ability to use good programming style.

1. Demonstrate proper use of white space (between lines and indentation).
2. Use appropriate naming conventions for identifiers (variables, methods, functions, and file names).
3. Construct identifiers with meaningful format; camelCase and underscore.

Objective 2 Understand the software development life-cycle.

1. Identify specifications and understand requirements to create a solution to a problem.
2. Develop a program using external documentation (flowcharts, abstracts, and pseudocode) to break down the problem into sub-components.
3. Design solutions using algorithms.
4. Write the code to implement the algorithm.
5. Test program for verification of errors and proper functionality.
6. Provide internal comments in the IDE that explain functionality through documentation (i.e comments, notes, program instructions) • Redo all steps as needed.

Objective 3 Identify the components of a programming language syntax.

1. Understand keywords, identifiers, operators, and operands.
2. Understand statements and expressions in a program.

3. Understand program components such as functions, methods, or procedures

Standard 2 Performance Evaluation included below (Optional)

STANDARD 3

Students will demonstrate effective use of commands and operations

Objective 1 Employ basic use of elements and data types of a programming language.

1. Declare, initialize, and assign values to constants and variables.
2. Demonstrate the ability to use input and output commands.
3. Declare and use variable types (primitives, reference, or object).
4. Identify proper data types for a specified application (boolean, integer, floating point, strings).

Objective 2 Employ basic arithmetic expressions.

1. Use basic arithmetic operators (modulus, multiplication, division, addition, subtraction).
2. Understand order of operation of expressions.
3. Write expressions that mix floating-point and integer expressions.

Standard 3 Performance Evaluation included below (Optional)

STANDARD 4

Students will properly employ control and loop structures

Objective 1 Demonstrate the ability to use relational and logical operators in programs.

1. Compare values using relational operators (, ==, >=, <=, etc.)
2. Form complex expressions using logical operators.

Objective 2 Demonstrate the ability to use decisions in programs.

1. Employ simple IF structures.
2. Use IF-ELSE and nested IF-ELSE structures.

Objective 3 Demonstrate the ability to use loops in programs.

1. Demonstrate knowledge between for-loops, while-loops, and do-while loops.
2. Describe the various ways that loops can end (i.e., sentinel, break, condition fail, etc.).
3. Design loops so they iterate the correct number of times (i.e., off by one errors, infinite loops, etc.).

4. Utilize nested loops.

Standard 4 Performance Evaluation included below (Optional)

STANDARD 5

Students will be aware of career opportunities in the Computer Programming/Software Engineering industry and ethical applications

Objective 1 Investigate career opportunities, trends, and requirements related to computer programming/software engineering careers.

1. Identify the members of a computer programming/software engineering team: team leader, analyst, senior developer, junior developer, and client/subject matter expert.
2. Describe work performed by each member of the computer programming/software engineering team.
3. Investigate trends and traits associated with computer programming/software engineering careers (creativity, technical, leadership, collaborative, problem solving, design, etc.).
4. Discuss related career pathways.

Objective 2 Have an understanding of current ethical issues dealing with computer programming and information in society.

1. Explain the impact software can have on society (i.e., privacy, piracy, copyright laws, ease of use, etc.).
2. Explain the ethical reasons for creating reliable and robust software.
3. Describe how computer-controlled automation affects a workplace and society.

Standard 5 Performance Evaluation included below (Optional)

Computer Programming I

Performance assessments may be completed and evaluated at any time during the course. The following performance skills are to be used in connection with the associated standards and exam. To pass the performance standard the student must attain a performance standard average of 8 or higher on the rating scale. Students may be encouraged to repeat the objectives until they average 8 or higher.

Student's Name: _____

Class: _____

PERFORMANCE STANDARDS RATING SCALE

STANDARD 1 – Programming Language IDE Score:

- ☐ Use an IDE to create a solution to solve a problem.

STANDARD 2 – Program Development Methodology Score:

- ☐ Demonstrate knowledge of program development methodology through a project.

STANDARD 3 – Commands and Operations Score:

- ☐ Demonstrate effective use of basic commands and operations.

STANDARD 4 – Control and Loop Structures Score:

- ☐ Properly employ control and loop structures.

STANDARD 5 – Career Opportunities and Ethics Score:

- ☐ Develop awareness of career opportunities in the computer programming/software engineering industry ethical applications.

PERFORMANCE STANDARD AVERAGE SCORE:

Evaluator Name: _____

Evaluator Title: _____

Evaluator Signature: _____

Date: _____