Computer Programming

Unit		Objectives
Data Structure Concepts	1	Create a program using a list
	2	Create a program using one- and two-dimensional arrays
	3	Create a program using a sort routine
	4	Create file structures
	5	Describe database structures (e.g., fields, records, files, and tables)
	6	Write code to append, delete, and update a table or a file
	7	Create a database file with one or more tables for manipulation by program code
	8	Write code to search, sort, and query a data structure
Logical Problem-Solving Skills	1	Analyze a problem
	2	Determine the steps needed to solve a problem
	3	Create an algorithm to solve a problem
	4	Illustrate the problem solution using a storyboard, flowchart or pseudocode
	5	Build a program from a storyboard, flowchart, or pseudocode
	6	Explain how to create and integrate reusable component into a program
	7	Explain how a program is tested and accepted for release
	8	Document code.
Program Algorithms	1	Use correct syntax and naming conventions of a given programming language
	2	Create a program using internal documentation
	3	Identify the use and limitations of different data types (integer, double, and constant)
	4	Create programs that include: variables and constants; counters and accumulators; arithmetic operations and functions; conditional statement; loop instruction; required user input; input validation; opening, writing, and reading from a data file; producing formatted output; modular program using one or more methods; that passes data to methods using parameters
	5	Identify type of errors (e.g. syntax, run-time and logic)
	6	Create a program with a standard graphic user interface (GUI) that includes: objects and menus; and a custom GUI
	7	Modify an existing program
	8	Create a program in collaboration with a team
	9	Describe and practice steps of troubleshooting and debugging
Additional Programming Concepts	1	Discuss considerations in programming for efficiency (e.g., computer time, programmer time, etc.)
	2	Discuss how to create a user-friendly program
	3	Describe event-driven programming
	4	Describe error catching/handling
	5	Compare object-oriented programming with structured programming
	6	Describe and/or practice mobile application programming
	7	Discuss handicap accessibility considerations in programming
	8	Create a program using multimedia
	9	Practice programming for efficiency
	10	Practice error catching/handling

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Unit	**Objectives**
Computer Concepts	1 Trace the development of computers and their impact on society
	2 Describe the categories and evolution of programming languages
	3 Explain the functions of computer hardware and architecture
	4 Demonstrate an understanding of computer theory (e.g., bits, bytes, binary logic, memory, and storage)
	5 Compare computer operating systems (e.g., DOS, Windows, Linux, Android)
	6 Discuss legal/ethical issues related to computers
	7 Identify the application environment/interface for the specific language being covered (e.g., JCreator, BlueJay, and Visual Studio)
	8 Explain the concept of security and its relationship to programming
	9 Identify components of the information system model (input, process, output, storage)
	10 Identify types of Network (Internet, LANs, and Wireless)
Prepare for Employment	1 Demonstrate working as a team
	2 Search the web and other places to locate career-planning information and job opportunities related to programming
	3 Identify careers in the information technology field
	4 Demonstrate communication skills
	5 Demonstrate logical thinking
	6 Demonstrate interpersonal skills
	7 Create a resume
	8 Demonstrate good interview skills
	9 Exhibit leadership skills through a student organization (e.g. FBLA, PBL, ACM)

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