

Computer Programming 12

Unifying Concepts

Students will be expected to

1. understand and apply the basic skills and processes of problem solving using computer programming
2. identify problems, select effective strategies, and plan solutions
3. apply programming techniques to develop solutions to a range of problems
4. work collaboratively to define and solve a realistic problem by creating a solution

Specific Curriculum Outcomes

Students will be expected to

Module 1: Problem Solving in Computer Programming

- 1.1 demonstrate an understanding of the role of number systems in data storage
- 1.2 apply mathematical concepts, including Boolean logic and operators
- 1.3 define a problem in explicit terms using object-orientated analysis
- 1.4 identify and outline strategies to solve a range of problems
- 1.5 apply a range of problem-solving skills
- 1.6 demonstrate an understanding of ethical, moral, and legal issues in information technology
- 1.7 investigate a range of related career opportunities

Module 2: Fundamentals of Programming

- 2.1 demonstrate an understanding of the syntax and features of a programming language
- 2.2 identify and frame problems
- 2.3 demonstrate an understanding of how data structures are used to solve problems
- 2.4 use appropriate methods and terms to develop a plan to solve a problem
- 2.5 apply and plan to solve a problem using a programming language
- 2.6 demonstrate an understanding of the effectiveness of other people's programs and documentation

Module 3: Applied Problem Solving

- 3.1 work individually and collaboratively to develop program tools, components, and strategies to create solutions
- 3.2 create a user interface using effective design principles
- 3.3 apply input/output operations
- 3.4 apply data-manipulation techniques
- 3.5 apply data-formatting principles
- 3.6 apply error-handling techniques/validation

Module 4: Project Development

- 4.1 analyze a problem
- 4.2 develop a project plan, including definition, scope, roles, resources, steps, and deadlines, for a solution
- 4.3 demonstrate the collaborative skills and behaviours required to work with others
- 4.4 identify information needs and locate, evaluate, and select resources
- 4.5 build and deploy a solution
- 4.6 create documentation associated with the project
- 4.7 test and refine the solution
- 4.8 present the solution
- 4.9 reflect on the solution, the process, and their own learning
- 4.10 explore various educational and career paths in information technology fields