

Unit 4 Programming

This 12-week foundation training course is designed to align with the **Unit 4: Programming**, for the **BTEC Level 3 National Diploma/Extended Diploma in Information Technology**.

Week	Topics	Key Concepts & Activities	Assessment / Tasks
1	Introduction to Programming Concepts	- Sequence, selection, iteration- High vs low-level languages- IDE overview (Python recommended)	- Programming baseline test- Lab: "Hello World"
2	Problem Analysis & Requirements <i>(Learning Aim A)</i>	- Understand user requirements- Create problem statements- Identify inputs, processes, outputs	- Write a scenario-based problem brief- Decompose a basic problem
3	Design Techniques <i>(Learning Aim A)</i>	- Flowcharts, pseudocode- Structure diagrams- User interface sketches	- Design task: Create a flowchart and pseudocode- Peer feedback
4	Variables, Data Types, Operators <i>(Learning Aim B)</i>	- Declaring variables- Arithmetic and logical operators- Data types (int, float, string, bool)	- Code tasks: variable practice- Worksheet
5	Control Structures	- If statements, loops (for/while)- Nesting and logical conditions	- Mini project: menu system- Code review
6	Procedures and Functions	- Modular design- Parameters and return values	- Program task: Create reusable procedures- Testing with inputs
7	Working with Data Files	- Reading and writing to text files- Simple CSV handling	- File-handling task- Error trapping practice
8	Lists and Arrays	- Using lists/arrays- Iterating over data- Searching and sorting basics	- Lab: Store student names and scores- Design sorting logic
9	Testing and Debugging <i>(Learning Aim C)</i>	- Types of errors: syntax, logic, runtime- Test plans: normal, boundary, erroneous	- Create and complete a test plan- Fix bugs in sample code

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10 Evaluation and Documentation <i>(Learning Aim C)</i>	- Self-evaluation techniques- User feedback- Annotated code & user guide	- Program evaluation draft- Final documentation planning
11 Final Programming Project Build	- Independent project based on set brief- Ensure design, code, testing, and evaluation included	- Project milestone check- Peer code walkthrough
12 Review and Submission	- Final testing and improvements- Submit full solution, evaluation & user guide	- Individual showcase- Assessment checklist completed
