**Unit 2 Computing Course**

Unit 2 timeline for 16 weeks.

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| **Area of Study 1: Programming** |
| **Week** | **Key Knowledge** | **Key Skills** |
| **1** | **Data and information*** characteristics of data types and methods of representing and storing text, sound and images
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| **2** | **Digital systems*** functions and capabilities of key hardware and software components of digital systems required for processing, storing and communicating data and information
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| **3** | **Approaches to problem solving*** functional requirements of solutions
* methods for creating algorithms such as identifying the required output, the input needed to produce the output, and the processing steps necessary to achieve the transformation from a design to a solution
* suitable methods of representing solution designs such as data dictionaries, data structure diagrams, object descriptions and pseudocode
 | * interpret solution requirements
* select and use appropriate methods for expressing solution designs, including user interfaces
* apply techniques for manipulating data and information using a programming or scripting language
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| **4** | **Approaches to problem solving*** characteristics of effective user interfaces, for example useability, accessibility, structure, visibility, legibility, consistency, tolerance, affordance
* techniques for manipulating data and information
* naming conventions for files and objects
* testing and debugging techniques, including construction of test data.
 | * devise meaningful naming conventions for files and objects
* apply testing techniques using appropriate test data.
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| **5** | **Outcome 1: Assessment task** |    |

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| **Area of Study 2: Data analysis and visualisation** |
| **Week** | **Key Knowledge** | **Key Skills** |
| **6** | **Data and information*** sources of authentic data in large repositories
* factors influencing the integrity of data, for example accuracy, timeliness, authenticity, relevance
* characteristics of data types and data structures relevant to selected software tools
 | * prepare data structures relevant to the software tools
* interpret selected data, identifying relationships and patterns
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| **7** | **Approaches to problem solving*** types and purposes of data visualisations
* problem-solving activities related to analysing needs: functional and non-functional requirements and constraints
* characteristics of file formats and their suitability to be converted to other formats
 | * analyse needs to define specific requirements
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| **8** | **Approaches to problem solving*** design tools for representing data visualisations
* formats and conventions applied to visualisations to improve their effectiveness for intended users
 | * select and apply appropriate tools to represent the design of selected visualisations
* use appropriate software and select and apply functions, formats and conventions to manipulate the extracted data to create data visualisations
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| **9** | **Approaches to problem solving** * functions of appropriate software tools to  extract targeted data and to manipulate data when developing visualisations
* criteria and techniques for evaluating visualisations.
 | * identify and extract, using software functions, formats and conventions to manipulate the extracted data from appropriate data sources
* select appropriate techniques and apply criteria to determine the extent to which data visualisations meet users’ needs.

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| **10** | **Outcome 2: Assessment task** |    |

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| **Area of Study 3: Data management** |
| **Week** | **Key Knowledge** | **Key Skills** |
| **11** | **Data and information*** data sources and methods of data acquisition
* characteristics of effective data collection tools and user interfaces for the purposes of entering data efficiently
* characteristics of data types
 | * identify and collect data from appropriate sources, using data collection tools that facilitate efficient data
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| **12** | **Digital systems*** capabilities and limitations of database management software to manipulate data
* roles, functions and characteristics of hardware components used to input, store, communicate and output data and information
* accidental and deliberate security threats to data and information stored within databases
* physical and software controls suitable for protecting the security of stored and transmitted data
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| **13** | **Approaches to problem solving*** the structure of a database, including fields, records and tables
* design tools for representing input forms to capture data and reports to meet specific needs
* design tools for representing the structure of databases
* techniques for manipulating and validating data
* formats and conventions applied to create effective solutions
 | * use appropriate techniques to describe data types and database structures
* apply suitable functions to validate and manipulate data efficiently
* construct queries to locate data that matches specific criteria
* apply formats and conventions to create effective forms and reports
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| **14** | **Interactions and impact*** applications of database systems in a range of settings
* personal benefits and risks arising from the use of databases.
 | * analyse needs or opportunities for database management solutions
* evaluate the value of using a database system in fulfilling a personal need.
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| **15** | **Outcome 3: Assessment task** |    |
| **16** | **Outcome 3: Assessment task** |    |