**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 |  |
| **2** | **Digital systems**   * functions and capabilities of key hardware and software components of digital systems required for processing, storing and communicating data and information |  |
| **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 |
| **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. |
| **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 |
| **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 |
| **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 |
| **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. |
| **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 |
| **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 |  |
| **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 |
| **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. |
| **15** | **Outcome 3: Assessment task** |  |
| **16** | **Outcome 3: Assessment task** |  |