AS/A Level Applied Information and Communication Technology 9713
Unit 16: Integration 3 – Automation

Recommended Prior Knowledge
Students will require a basic knowledge of, and some practical skills in:

- the use of hyperlinks;
- the use of code to assist an applications package;
- manipulation and selection of data using the facilities of database, spreadsheet and word processing applications.

In preparation for this module it is recommended that the material from IGCE Applied Information and Communication Technology (syllabus 9713) AS Level has been covered, including sections 8 (Software selection), 9 (Communication), 10 (Document and Presentation Production), 11 (Data Manipulation), 12 (Integration), 13 (Output Data), 14 (Spreadsheets) and objectives 15 (Mail Merge) and 17 (Output Data) from the A2 Level.

This should include the following:

- selecting software
- entering data with 100% accuracy;
- opening/loading/importing stored data;
- creating and controlling an electronic document including mail merge documents;
- defining database record structures and field types;
- sorting data (alphabetical/numeric, ascending/descending);
- selecting data by specified criteria (AND/OR/NOT);
- save/export data for use in other formats including text files;
- creating a spreadsheet model including page and display features.

In preparation for this module you could also cover the basic knowledge of file management techniques including:

- creating, renaming and deleting files/folders;
- browsing a directory or folder;
- saving files in different formats

Context
For A2 level the candidates must be able to meet all of the Assessment Objectives 8 to 14 for AS level. Subject to this requirement, this sub-unit may be studied on its own or in conjunction with the other A2 practical units. It is recommended that candidates study units 15 (Mail Merge) and 17 (Output Data) prior to this one.

Outline

This sub-unit covers the following areas:
The use of appropriate software to:

- select appropriate application for a given task
- design and create a solution to the task to select electronic documents
- design and create a solution to the task to select data to be merged with and/or integrated into electronic documents under user control
- design and include error checking and validation tests into these documents,

Candidates will also need to:

- understand the purpose of validation and verification
- manually verify data entry
- create and use a range of validation rules

AO	Learning outcomes	Suggested Teaching activities	Learning resources
16a(i)	Select the most appropriate software application for a particular task	Teach the range of software available within the centre and the function and use of each type of software. Teach the balance between functionality and the time required to create each option, in order to obtain that functionality. This should include descriptions of macros, hyperlinks (from documents, web pages, etc), mail merge, and code generated from an applications package.	Show examples of each type of software available. These should include: a word processor with mail merge facilities and associated spreadsheet/database/word processed table to provide source data; Software (could be word processor, spreadsheet or database with macro facilities); documents or web pages containing hyperlinks; and a programming language which may be generated by the applications package. This may be a linear structured language, but is more likely to be an object oriented language like VBA, Visual Basic or C++. Discuss the strengths and limitations of each of the above types of software for a variety of different applications, including selecting from a range of available documents and data, and for selecting a particular document type and data range for that document. Examples might include: selecting the creation of an invoice, reminder or receipt for a particular order number; or selecting and producing all orders placed in June to a particular supplier using an automated menu or splash screen. For each of these types of software discuss the relative advantages and disadvantages including the functionality and limitations of each and the time taken to create the required selection process.
16a(ii)	Set up a suitable selection facility which will allow the required document/s to be selected	Design a menu / splash screen and the appropriate code in order to allow the user to select, open and run a particular document or file from a pre-determined list Each of the following activities are examples, your choice of	Prepare a variety of documents or data files that can be opened or executed using the selection process. A variety of worksheets and exercises to give an

AO	Learning outcomes	Suggested Teaching activities	Learning resources
		software may restrict some of these activities: **Write a macro to select from a list of available documents or files.** Teach the programming language required to write a macro in an applications package. **Create hyperlinks to select from a list of available documents or files.** Teach the creation of hyperlinks from web pages, documents, or other applications packages. **Write a program or routine (preferably from within the applications package, for example VBA) to select from a list of available documents or files.** Using the tools within the applications package (for example using wizards or recording macros) generate code and edit this code to create a menu or splash screen selecting the required data/document/file. The features of whichever package/s and language/s that are selected could include the development of a splash screen, or menu using features like: a drop down menu, push buttons, radio buttons, list box, combo box and a command button.	understanding of structured code.
		Revision on the students' understanding of the purpose of validation. Revise methods of validating and data and selecting the right method for different applications.	Exercises in setting and testing validation rules applied to individual data items including the writing of validation routines in a programming language to test data entry and trap errors.

16a(iii)	Set up a suitable selection facility which will allow the required document/s to be selected and to allow the user to select the data within the document/s.	Design a menu / splash screen and the appropriate code in order to allow the user to select, open and run a particular document or file from a pre-determined list and allow the user to select the data selected within this document or file. Each of the following activities are examples, your choice of software may restrict some of these activities: **Write a macro to select from a list of available documents and open the document using merged data from a specified file or files.** Teach the programming language required to write a macro in an applications package to open a document, then to select the data to be used within the finished document. **Write a program or routine to select from a list of available documents and open the document using merged data from a specified file or files.** Teach the use of a programming language (which may be a linear structured language or an object oriented language like C++, Visual Basic or VBA) in order to create a menu or splash screen selecting the required document, then to select the data to be used within the finished document. The features of whichever package/s and language/s that are selected could include the development of a splash screen, or menu using features like: a drop down menu, push buttons, radio buttons, list box, combo box and a command button.	Prepare a variety of documents and associated data files that can be opened and merged using user defined choices. A variety of worksheets and exercises to develop structured programming skills.

Please note: It is impossible to give precise examples or exercises as the software selected within each centre will vary dramatically. For example: If a candidate is required to produce a menu to select between an invoice, reminder or receipt. The candidate must then select and print invoices for order numbers 997 to 1002, a receipt for order 1003 and a reminder for orders 1004 to 1006 using this automated system.

One candidate may choose to use a large database system with user generated splash screens or menus and reports based upon data selected from tables of data or the results of searches. It may require the order number or numbers to be entered after the type of document has been selected.

Another candidate may use a programming language to write a menu where the order number or numbers are selected prior to the document type and this would be used to launch a word processing package with mail merge facility with automated documents.

For each example like this there are many methods which would provide suitable solutions. All students would need a variety of skills which should include programming skills related to launching, running and selecting data from within applications packages.