-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number-   **0091111**   **-Session- 1989-90**

-Superclass-   **CB**

-Title-   **INTRODUCTION TO COMPUTER PROGRAMMING -**
                        BASIC

-DESCRIPTION-

Purpose   This module is designed to introduce the student to a
                    computer programming language in a problem - solving
                    context.

                    The module is suitable for a range of applications and can
                    be tailored to suit the needs of the student's occupation or
                    special interest. It is particularly suitable for mainstream
                    Computing students.

Preferred   No formal entry requirements
Entry Level

Learning   The student should:
Outcomes
                    1.   apply a recognised problem-solving technique in the
                          context of computer programming;

                    2.   use systems software to manage program files in
                          the context of programming;

                    3.   produce tested programming language code.

Content/
Context

Corresponding to Learning Outcomes 1-3

1.   Use of analysis techniques to reduce simple problems into a set of sub-problems.

Use of control structures: sequence, selection and repetition.

Creation of suitable test data and 'dry-running' of the test data to check the logic of the solution.

2.   Interpreted Languages

Use of file management procedures appropriate to the system. Activities associated with the management of file creation, storage, retrieval, printing of programs.

Compiled Languages

Use of an editor. Use of file management procedures appropriate to the system.

3.   Use of operators, control structures, data types, input/output statements, sub-programs.

Creation and use of test data. Interpretation of error messages and use of corrective action.

Suggested
Learning and
Teaching
Approaches

Students may work in pairs or in groups when analysing the requirements of a problem specification.

Suitable code fragments may be used to enable the student to construct useful programs without having to be too involved with detailed programming.

The student should learn the keywords and the control structures of the language by being led through a series of problems. Desk-based planning of a computer solution to a problem is seen as a required activity. Testing of the logic of the planned solution with suitable test data should be introduced as soon as possible.

The student is expected to adopt a structured approach when planning and coding programs. Any of the accepted planning techniques may be utilised.

Note that the use of the unconditional branch GOTO is not compatible with the current thinking on structured programming.

"Dry running" of programs with suitable test data is to be encouraged to check program logic and validity of program output.

Assessment
Procedures

Acceptable performance in the module will be satisfactory achievement of all the Performance Criteria specified for each Learning Outcome.

The following abbreviations are used below:

LO   Learning Outcome
IA   Instrument of Assessment
PC   Performance Criteria

LO1   APPLY A RECOGNISED PROBLEM-SOLVING TECHNIQUE IN THE CONTEXT OF COMPUTER PROGRAMMING

PC   The student:

(a)   represents a solution to the problem;
(b)   creates test data;
(c)   uses the test data to check the logic flow.

IA   Assignment

The student will be presented with an assignment to test the ability to apply a problem solving technique to solve a problem related to Computing.

The problem must enable the use to be made of sequence, selection and repetition in its solution. The problem must require sub-division into a number of sub-problems and at least one of the sub-problems must require further division.

Satisfactory achievement of the Learning Outcome will be based on all Performance Criteria being met. This will be demonstrated by the student correctly producing a working solution and creating applicable test data.

LO2   USE SYSTEMS SOFTWARE TO MANAGE PROGRAM FILES IN THE CONTEXT OF PROGRAMMING

PC   The student uses systems software to:

(a)   create;
(b)   store;
(c)   retrieve;
(d)   edit;

(e)   print

a program file in accordance with a given specification.

IA   Practical Exercise

The student will be presented with a practical exercise to test the skills required to manage a file using systems software.

The student will be given a program listing on paper. He/she will carry out the 5 operations listed in the Performance Criteria above.

Satisfactory achievement of the Learning Outcome will be based on all Performance Criteria being met. This will be demonstrated by the student correctly producing printed hard copy output of the file in accordance with the specification.

LO3   PRODUCE TESTED PROGRAMMING LANGUAGE CODE

PC   The student:

(a)   uses the following range of constructs to produce working code:
       (I)   arithmetic operators;
       (ii)   comparators;
       (iii) control structures(sequence, selection, repetition);
       (iv)   data types;
       (v)   input/output;
       (vi)   sub-programs;
       (vii)arrays (1 dimensional);
(b)   produces working code which contains internal documentation;
(c)   tests the program using applicable test data.

IA   Practical Exercises

The student will be presented with between 2 and 6 short practical exercises to test the ability to use the constructs of the programming language. Between them the exercises should require the use of all the constructs listed in Performance Criteria (a) (i) - (vii). The working tested code should contain internal documentation.

Satisfactory achievement of the Learning Outcome will be based on all Performance Criteria being met. This will be demonstrated by the student successfully running a program and producing a hard copy listing of the program

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for each exercise. Hard copy output should be produced
for at least one exercise.