






Diploma in System Design (401) – Pascal Programming

Prerequisites: Basic knowledge of computing terminology.	Corequisites: A pass or better in Certificate in Computer Fundamentals or equivalence.
Aim: This course is designed to give the candidates an introduction to Pascal programming. Candidates will utilise the commands, statements, and procedures of this language to develop computer programs. At the end of the course, candidates will be able to describe the syntax rules governing expressions and statements in Pascal.	
Required Materials: Recommended learning resources.	Supplementary Materials: Lecture notes and tutor extra reading recommendations.
Special Requirements: Building Pascal applications. This is a hands-on course, hence use of the computers is mandatory.	
<p>Intended Learning Outcomes:</p> <p>1. Design simple Pascal programs using variables, constant assignment statements and comments.</p> <p>2. Identify reserved words in Pascal. Illustrate the use and description of reserved words. Describe the meaning and purpose of reserved words.</p> <p>3. Identify the concept of 'Program Control'. Develop effective programs by obeying the most important rules of programming: the IF statement (decision making), FOR Loop and the REPEAT...UNTIL loop.</p>	<p>Assessment Criteria:</p> <p>1.1 Describe structured programming</p> <p>1.2 Describe how Pascal programs begin and end</p> <p>1.3 Demonstrate the difference between <i>Write</i> and <i>Writeln</i></p> <p>1.4 Define how to display blank lines on the screen</p> <p>1.5 Outline the different datatypes</p> <p>1.6 Demonstrate how to get user's input</p> <p>1.7 Describe the difference between <i>Read</i> and <i>Readln</i></p> <p>1.8 Demonstrate how to view and pause the screen after the program ran</p> <p>1.9 Demonstrate how to declare variables in Pascal</p> <p>2.1 Describe <i>Clrscr</i></p> <p>2.2 Define <i>GotoXY(,)</i></p> <p>2.3 Define <i>Textbackground()</i></p> <p>2.4 Define <i>Textcolor()</i></p> <p>2.5 Define <i>Readkey</i></p> <p>2.6 Define <i>Delay()</i></p> <p>2.7 Define <i>Halt / Halt()</i></p> <p>3.1 Demonstrate the IF statement (<i>IF...Then ...Else, Nested IF</i> statements)</p> <p>3.2 Demonstrate the <i>Repeat... Until Loop</i></p> <p>3.3 Demonstrate the <i>FOR Loop</i> (Nested FOR loop)</p> <p>3.4 Demonstrate the <i>WHILE...DO</i> loop</p> <p>3.5 Explain the operation of the IF statement</p> <p>3.6 Explain the syntax of conditional statements</p> <p>3.7 Explain how to use Nested IF statements</p> <p>3.8 Use Flowchart diagrams to express IF statement</p> <p>3.9 Explain the characteristics of all loop syntaxes in Pascal and explain the differences between them</p>

<p>4. Explore other ways of writing conditional statements using CASE ...OF statement. Demonstrate the ability to diversify programming skills.</p>	<p>4.1 Define how to design simple <i>IF...ELSE</i> statement using <i>CASE...OF</i></p> <p>4.2 Demonstrate how to design simple Menu programs using <i>CASE...OF</i></p> <p>4.3 Describe how to design complex programs using <i>CASE...OF</i></p>
<p>5. Identify the use of logical operators and Boolean expressions.</p>	<p>5.1 Define logical operators and how they can be used in Pascal programming</p> <p>5.2 Define the types of logical operators (AND, OR, NOT)</p> <p>5.3 Define Boolean expressions and how do they differ from logical operators.</p>
<p>6. Identify how large programs are broken down into small programs by using procedures and functions.</p>	<p>6.1 Explain the syntax of procedures and functions</p> <p>6.2 Explain the differences between procedures and functions</p> <p>6.3 Explain the differences between pass by value and pass by reference</p> <p>6.4 Explain the differences between global variable and local variable</p> <p>6.5 Explain the rule of calling procedures / functions.</p>
<p>7. Analyse how files are implemented in Pascal programming.</p>	<p>7.1 Describe how to create and write to a file</p> <p>7.2 Demonstrate how to read from a file</p> <p>7.3 Demonstrate how to append data to an existing file</p> <p>7.4 Demonstrate how to delete files</p> <p>7.5 Demonstrate how to create and remove sub-directory</p> <p>7.6 Illustrate how to find the size of a file using <code>FileSize()</code></p>
<p>8. Describe the use and power of data structures in programming. Analyse the use of static and dynamic data in programming. Appreciate the differences between variables and arrays.</p>	<p>8.1 Describe the purpose of arrays</p> <p>8.2 Describe array declarations</p> <p>8.3 Understand how to design programs using arrays</p> <p>8.4 Describe the use of an array and the different arrays available</p>
<p>9. Understand the concept of records as special types of data structures. Differentiate records from arrays. Describe how records collect different types of data.</p>	<p>9.1 Define records using the <code>TYPE</code> definition</p> <p>9.2 Define the <code>WITH</code> keyword</p> <p>9.3 Identify the use of array of records</p> <p>9.4 Demonstrate how to design a database, which allows a user to: add new record, edit an existing record, view a particular record in a list, delete record and sort records</p>
<p>10. Define the process of producing a full working Pascal program.</p>	<p>10.1 Identify programming syntax errors</p> <p>10.2 Separate processes</p> <p>10.3 List the solution steps of each process</p> <p>10.4 List the data requirements</p> <p>10.5 Determine the output requirements</p> <p>10.6 Construct an algorithm to do the process</p> <p>10.7 Use creativity to expand the input, process and output</p> <p>10.8 Think of all other useful things to add in program</p> <p>10.9 Implement the program, step by step</p>

	10.10	Combine all the programs to tackle the problem. All the modules of each process should be gathered
	10.11	Generalise the input procedure to fit in each module to save energy and time
	10.12	Combine them using menus.

Recommended Learning Resources: Pascal Programming

Text Books	<ul style="list-style-type: none"> • Fundamentals of Pascal, Understanding Programming and Problem Solving (Hardcover) by Douglas W. Nance. ISBN-10: 0314205543 • Schaum's Outline of Theory and Problems of Programming With Pascal (Paperback) by Byron S. Gottfried. ISBN-10: 0070238499 • Turbo Pascal: Programming and Problem Solving (Paperback) by Sanford Leestma and Larry Nyhoff. ISBN-10: 0023694114
Study Manuals 	BCE produced study packs
CD ROM 	Power-point slides
Software 	Pascal Programming

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