

**DEPARTMENT OF COMMERCE (SF)**  
**DEVA MATHA COLLEGE KURAVILANGAD**

**Affiliated to Mahatma Gandhi University, Kottayam**



**SYLLABUS**

**ADD-ON COURSE**  
**IN**  
**DIPLOMA IN COMPUTER APPLICATIONS (DCA)**

**Academic Year: 2018-19**



**DEVA MATHA COLLEGE KURAVILANGAD**

**DEPARTMENT OF SELF FINANCE COMMERCE**

*Add on Courses offered for Students: 2018-2019*

**DCA**

**Department Coordinator: Mr. Lenin Joy**

Course Co-dominator: Mr. Lenin Joy, Assistant Professor, Department of Commerce (SF)

Duration: 1 year

Instructional Hours: 260 hrs Hours

Intake in a batch: 80-100

Eligibility: SSLC & Above

Mode of Instruction: Offline

**Add-on Course**  
**on**  
**DIPLOMA IN COMPUTER APPLICATIONS (DCA)**

The main objective of the course is to covers the basics of computers and makes the students proficient in operating systems, Word processing, spreadsheet, internet operations and programming in the most popular and User friendly Visual Basic, .NET, C++ & Java. Certificates from Kerala State Rurtonix will be issued to the eligible students based on their scores in qualifying examination. Students who score a minimum of 40% marks in final theory examination, minimum of 50% marks in the final practical examination and 50% overall average for every subject would be declared successful. Certificates from Deva Matha College, Kuravilangad will be issued to the eligible students based on their scores in qualifying examination Conducted by Department of Commerce (SF) Deva Matha College, Kuravilangad.

**DETAILS OF THE COURSE:**

Name of course : DCA  
Qualification : SSLC & ABOVE  
Duration : 1 year (260 Hours)

## **Syllabus of the Course**

**Objective of the Course:**

A twelve months course, which covers the basics of computers and makes you proficient in Operating Systems, Word processing, spreadsheet, Internet operations and programming in the most popular and User friendly Visual Basic, .NET, C++ & Java. After the completion of this course he/she will have become an expert in Microsoft Office package and able to create any Desktop application using development tool- Visual studio.

## MODULE WISE SYLLABUS

PAPER	SUBJECT	THEORY(Hrs)	PRACTICAL(Hrs)
	<b>Semester I</b>	Theory	Lab
I	Computer fundamentals, internet concepts and OS	30	20
II	Office suit	30	20
III	Java and C++ programming	30	20
	<b>Total</b>	90	60
	<b>Semester II</b>		
IV	System engineering and essentials of VB and VB.net	60	30
V	Project		20
	<b>Total</b>	150	110

## Detailed Syllabus

<b>Paper I: Computer fundamentals , Internet concepts and Operating Systems</b>		
<b>Module-I : Computer fundamentals , Internet concepts (Theory:40 hrs. practical :10 hrs)</b>		
<b>Introduction</b> Computer -Definition, Characteristics etc. History of Computers Functions of Computer Applications of Computer Computer Classifications, About clock speed Net works of Computers	6	
<b>Number Systems</b> Representation of Data, various number systems , arithmetic in various number systems Bit, Byte, Characters, Field, Record, File Computers Languages	6	
<b>Functional Organization of a Computer</b> <b>Hardware</b> Input Device Output Device CPU Achievement Memory devices Secondary Memory devices	8	
<b>Software</b> System Software Application Software Compiler Interpreter Different operating Systems: Single User, Multi User and Multi Tasking OS Virus Affection and diagnosing tools	6	
<b>Types of personal computers</b> PC, PC/XT, PC/AT, LAP-TOP, PALM-TOP, and DESK-TOP Computers Minimum H/w and S/w Configuration	3	
<b>Program Design and logic</b> Algorithm and flowchart	4	
<b>Basic Concept of Networking Communication</b> LAN,MAN, WAN	2	
<b>Internet concepts</b> About Internet, Intranet, Extranet, Hardware & software requirement for internet (mention about modem, ISP, Browser etc.)- Types of internet connection and Internet & E-Mail	5	10
<b>Module II: Operating Systems ( Theory:20 hrs Practical:30 hrs)</b>		
<b>Ms-Dos: (Theory 6 hrs. :Practical 10hrs)</b> MS-DOS-Loading Operating system-boot sector &booting-boot sequence of dos system file-dos prompt-types of dos commands-external & internal-CLS,DATE,TIME,VER,VOL,DIR-VARIOUS SWITCHES(/W,/S,/L,/B)-SORTING OF DIRECTORY LISTING Internal Dos commands continuation-copy con, type, ren , copy (all options),del/erase, wild cards, prompt, directory and sub directory- sub directory commands-MD,CD,RD,CD.,CD\,PRINT ,path About files-file naming-types of files & file extensions(Program files, data files, text files, system files etc., batch files-special commands in batch file	6	10

<b>Ms-Dos: (Theory 3 hrs. :Practical 5hrs)</b> MS-DOS-Loading Operating system-boot sector &booting-boot sequence of dos system file-dos prompt-types of dos commands-external & internal-	3	5
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<p>CLS,DATE,TIME,VER,VOL,DIR-VARIOUS SWITCHES(/W,/S,/L,/B)-SORTING OF DIRECTORY LISTING</p> <p>Internal Dos commands continuation-copy con, type, ren , copy (all options),del/erase, wild cards, prompt, directory and sub directory- sub directory commands-MD,CD,RD,CD.,CD\,PRINT ,path</p> <p>About files-file naming-types of files &amp; file extensions(Program files, data files, text files, system files etc., batch files-special commands in batch file</p> <p>External Dos commands-</p> <p>label,mem,chkdsk,tree,deltree,more,diskcopy,diskcomp,format,scandisk,sys,xcopy,attrib,fdisk(hard disk partitioning), exe, .com, .bat files.</p>		
<p><b>Windows: (Theory 4 hrs. :Practical 10 hrs)</b></p> <p>About windows Operating System- different versions in hierarchical order-elements of windows screen-desktop-icons-system icons(my computer, my document, network neighborhood, recycle bin)-shortcut icons(program, folder, documents etc.),task bar and taskbar components, using mouse</p> <p>The start menu - different options, starting a program, elements of a window, My computer icon etc., create files &amp; folders, Windows accessories</p> <p>More about internet explorer</p>	4	5
<p><b>Linux: (Theory 3hrs: Practical 4 hrs)</b></p> <p>About Linux operating system- features-differences between other operating systems-Linux distributions</p> <p>Linux utilities – image viewer, file compression and decompression, sound player, movie player, internet browser, drawing utilities etc.</p> <p>Linux commands: Linux terminals – cp,mv,ls,clear,exit,date,rm,echo,pico,diff,grep,mke2fs,man,mkdir,less,mv,pwd,cd,cd..,date,free</p>	3	5
<b>Paper II: Office Suite</b>		
<p><b>Ms-word : About word processing and word processors ,features of Ms-word, Ms-word screen ,screen components, tool bars, Menus and Different menu commands –</b></p> <p>File menu-new, open, close, exit</p> <p>Page setup, Save, save as, print preview, print</p> <p>Edit-Cut-copy-paste, find-replace, undo-redo, go to ,</p> <p>Different screen views</p> <p>Insert-Inserting picture- clip art, word art, auto shapes, page numbers</p> <p>Zoom options, Headers &amp; Footers</p> <p>Formatting features-font, size , color, style, effects, alignment options, bullets numbering, change case ,paragraph options, columns, line spacing, Page border and shading, Drop cap , Back ground, format painter.</p> <p>Tools- Autocorrect, spell-check, thesaurus, mail-merge, handling of data files</p> <p>Tables-create and draw table, insert and delete rows and columns, split and merge cells, Table properties, convert text to table &amp; table to text</p> <p>Keyboard shortcuts.</p> <p>Using HELP menu</p>	6	6
<p><b>Ms-Excel: Introduction to spread sheets , features of Ms-excel, Ms-Excel screen ,screen components, tool bars, Formula bar</b></p>		

Work book & work sheets, cells, range, data types & entering data, insert rows & columns, resizing rows and columns, selecting cells, moving and copying cells, cut&paste cells, drag and drop, find & replace, formatting cell, text wrap, format painter, auto format, conditional formatting, formulas, functions, auto sum , sorting, filtering, goal seek , auto fill , auto filling functions, charts, pivot table reports, using help menu, Key board short cuts.		
<b>Ms-Power point: About presentations and creating of a presentation using power point</b> , Slide views, insert, delete, rearrange slides Objects-group, order , Applying animation effects, slide effects, slide transition Presenting slides- slide show, Time setting, Custom Show Printing Slides ,Slide show key board shortcuts		
Introduction to DBMS, Access as a relational DBMS, Tables, Forms ,Queries ,Reports, Macros ,Modules, Data type, Data Validation, Importing Data, Primary Keys , Field Properties SQL (Structural Query Language)		
Open Office: familiarization of Writer, Calc and Impress		
<b>Paper III : C++ and Java programming</b>		
<b>Module I- C++ (Theory 15 hrs.: Practical 15 hrs )</b>		
<b>Principles of Object-Oriented Programming: -</b> Object-Oriented Programming Paradigm, Basic Concepts of Object-Oriented Programming, Benefits of OOPS, Applications of OOP C++ Statements, Structure of C++ Program <b>Tokens, Expression and Control Structures.</b> Introduction, Tokens, Keywords, Identifiers and Constants, Basic Data Types, User-Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of Variables, Reference Variables, Operators in C++,Scope Resolution Operator, Member Dereferencing Operators, Memory Management Operators, Manipulators, Type Cast Operator, Expressions and their Types, Special Assignment Expressions, Implicit Conversions, Operator Overloading, Operator Precedence, Control Structures, Structures, Functions, Arrays, Strings, String library Functions. <b>Classes and Objects</b> Specifying a class, Defining Member Functions, Making an outside Function Inline, Nesting of Member Functions, Private Member Function, Array within a class, Memory allocation for objects, Static Data Member, Static Member Functions, Array of Objects, Object as function arguments. <b>Constructor and Destructors</b> Introduction, constructors, parameterized Constructors, Multiple constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructors, Dynamic Constructors and Destructor. <b>Functions in C++</b> The main Function, Function Prototyping, call by reference, Return by Reference, Inline Functions, Default Argument, Const. Arguments, Function Overloading, Friend and Virtual Function, Operator Overloading, Recursion.		

<p><b>Inheritance:</b> - Extending Classes Introduction, Defining Derived Classes, Single Inheritance, Making a Private Member. Inheritance, Multiple Inheritances, Multilevel Inheritance, Hierarchical Inheritance, Hybrid Inheritance. Pointers, Virtual Functions and Polymorphism Compile time Polymorphism, run time Polymorphism, Pointers to Objects, This Pointer, Pointers to Derived Classes, Virtual Functions and Pure Virtual Functions.</p> <p><b>Pointers, Virtual Functions and Polymorphism</b> Introduction, Pointers, Pointers to Objects, This Pointer, Pointers to Derived Classed</p> <p><b>Managing Console I/O Operations</b> C++ Streams, C++ Stream Classes</p> <p><b>Working With files</b> Classes for File Stream Operations, Opening and Closing a file, Detecting end –of-file, More about Open (): File Modes, File Pointers and Their Manipulations, Sequential Input and Output Operations, Updating a File: Random Access</p> <p><b>Exception Handling</b> Basics of Exception handling, Exception Handling Mechanism, Throwing mechanism, Catching mechanism, Rethrowing an Exception</p>		
<p><b>Module II- Java (Theory 15 hrs.: Practical 15 hrs )</b></p>		
<p><b>Java Evolution</b> –Java history- Java features- compiled an interpreted ,platform independent and portable , object oriented, robust and secure, distributed , simple, small, and familiar , multithreaded and interactive, high performance, dynamic and extensible – How Java differs from C++ - Java and Internet-Java and world Wide Web – Hardware and software soft ware requirements-Java support systems –Java Environment- Java development kit , application programming Interface</p> <p><b>Overview of Java language-</b> Simple Java program-class declaration, opening brace, the main line ,the output line – Use of math functions- comments –An application with two classes-Java program structure- documentation section, package statement, import statements, Interface statements, Class definitions ,main method class-Java tokens- Java character set, Keywords, Identifiers , Literals ,operators ,separators-Java statements-Implementing a Java program-creating the program, compiling the program, running the program – Java virtual machine –Command line arguments-programming style</p> <p><b>Constants, Variables and Data Types:</b> Constants- integer constant ,real constants, single character constants, string constants, backslash character constants- Variables-Data types-Integer types, floating point types, character type ,Boolean type – Declaration of variables-giving values to variables-assignment statement, read statement-Scope of variables-Symbolic constants-Type casting-automatic conversion-getting values to variables-</p>		



**Standard default values.**

**Operators and Expressions:** Arithmetic operators: Integer arithmetic, real arithmetic, Mixed –mode arithmetic-Real operators, Logical Operators-Assignment operators-Increment and decrement operators-Conditional operator-bitwise operators-special operators-instance of operator, dot operator – Arithmetic expressions-Evaluation of expressions-precedence of arithmetic operators-type conversion expressions-automatic type conversion, casting a value-Operator precedence and associativity -Mathematical functions

**Decision making and branching :**Decision making with if statement, simple if statement, simple if statement, the if –else statement-nesting of if-else statements-the else if ladder-the switch statement, the ?:operator

**Decision making and looping:** the while statement, the do statement, the for statement- additional features of for loop-nesting of for loops-Nesting of for loops-jumping out of a loop ,skipping out of a loop- Labeled loops

**Classes, Objects and methods:** defining a class- adding variables-adding methods-creating objects-accessing class members- constructors, methods overloading-static members-nesting of methods-inheritance-extending a class-defining subclass-subclass constructor, multilevel inheritance, hierarchical inheritance- Overriding methods-final variables and methods-abstract methods and classes- visibility control- public access-friendly access- protected access-private access- private protected access-rules of thumb

**Arrays ,Strings and Vectors :** arrays – one dimensional arrays- creating an array-declaration of arrays ,creation of arrays, initialization of arrays, array length- Two dimensional arrays – variable size arrays- strings- string arrays, string methods, string buffer class- Vectors

**Interfaces: Multiple Inheritance** –defining interfaces-extending interfaces-implementing interfaces-Accessing interface variables

**Packages :** Putting classes together- Java API packages- using system packages-naming conventions-creating packages accessing a package- using a package-adding a class to a package –hiding classes

**Multithreaded programming :** crating threads-extending the thread class- declaring the class- implementing the run( ) method, starting new thread –Stopping and blocking a thread – stopping a thread, blocking a thread-life cycle of a thread-newborn state, runnable state, running state, blocked state ,dead state – Using

<p>thread methods-Thread exceptions-thread priority ,Synchronization-implementing the runnable interface</p> <p><b>Managing errors and exceptions:</b> types of error- compile time errors, runtime errors - exceptions-syntax of exception handling code-multiple Catch statements-Using finally statement- Throwing our own exceptions-using exceptions for debugging</p> <p><b>Applet programming:</b> Local and remote applets-how applets differ from applications-preparing to write applets, building applet code-Applet Life Cycle- initialization state, running state, Idle or stopped state, dead state, display state- Creating an executable applet- designing a web page- comment section ,head section, body section- Applet Tag- Adding applet to HTML file –running the applet- more about applet tags-passing parameter to applets-aligning the display-more about HTML tags-displaying numerical values-getting input from the user and program analysis.</p> <p><b>Graphics programming:</b> The graphics class- lines and rectangles-circles and ellipses- drawing arcs-line graphs-using control loops in applets-drawing bar charts.</p> <p><b>Managing input-output files in Java: concept of streams-stream class-byte stream class</b> –input stream classes, output stream classes- Character stream classes –reader stream classes, writer stream classes – Using streams –other useful I/O classes, using the file class, Input/output exceptions –creation of files-Reading /writing characters, reading/writing bytes-handling primitive data types- concatenating and buffering files. – random access files- interactive input and output- simple Input and output – other stream classes – object streams ,piped streams, pushback streams filtered streams.</p> <p><b>Networking :</b> Socket programming- server socket(TCP/IP)-client socket (TCP/IP)- server sending message to client-Echo-server and client-datagram packet .datagram socket-UDP server –client conversation- URL – URL class –URL connection -JDBC and ODBC- Types of Drivers-Java SQL package-using JDBC-Driver Manager-creating connection-connection interface-creating statements-Statement interface-executing statements-prepared statement interface-Callable statement interface –ResultSet interface</p>		
<p>Paper IV: System engineering and essentials of VB and VB.net</p>		
<p>Module I: System Engineering:</p>		
<p><b>Introduction to System Engineering-System Definition and concepts:</b> General Theory systems, Manual and automated systems, Real-life Business Sub-Systems.</p>		

<p>System Environments and Boundaries. Real time and distributed systems. Basic principles of successful systems. Approach to system development: Structured System Analysis and Design, Prototype, Joint Application Development</p> <p><b>Systems documentation consideration: Principles of Systems</b> Documentation, Types of documentation and their importance, Enforcing documentation discipline in an organization</p> <p><b>System Planning: Data and fact gathering techniques:</b> Interviews, Group Communication, Questionnaires, Presentations &amp; Site Visits. Assessing Project Feasibility: Technical, Operational, Economic, Cost Benefits Analysis, Schedule, legal and contractual, Political. Modern Methods for determining system requirements: Joint Application, Development Program, Prototyping, Business Process Re-engineering. System Selection Plan and Proposal-Post implementation</p> <p><b>Modular and Structured Design:</b> Module specifications. Top-down and bottom-up design. Module coupling and cohesion. Structure Charts</p> <p>Input/Out put: Classification of forms, Input/output forms design. User-interface design, Graphical interfaces. Standards and guidelines for GUI design. Designing Physical Files and Databases: Designing Fields, Designing Physical Records, Designing Physical Files, Designing Databases. Introduction to CASE Tools, Features, Advantages and Limitations of CASE Tools, Awareness about some commercial CASE Tools.</p> <p><b>System Implementation and Maintenance :</b></p> <p>Planning considerations. Conversion methods, procedures and controls. System acceptance criteria. System Evaluation and Performance. Testing and Validation. Preparing User Manual. Maintenance Activities and Issues</p> <p><b>Introduction to Management Information System (MIS) :</b></p> <p>Meaning and role of MIS-Systems approach to MIS-</p> <p>Types of information systems: Transaction Processing System, Management Information System, Decision Support System, Expert System Case Studies (Illustrative): MIS for Accounting and Finance Function, MIS for Marketing System.</p>		
<p><b>Module II: VB and VB.net</b></p>		
<p><b>VB</b></p>		
<p><b>Introduction to Integrated Development Environment:</b> Elements of VB IDE: Menu bar, Toolbar, Project explorer, Toolbox, Properties window, Form designer, Form layout, Immediate, Locals and Watch window, Edit, View, Run, Debug, Object Browser.</p> <p><b>Managing Projects :</b> Concepts of VB projects-Creating the Project, Opening, Renaming and Saving the projects, Elements of user interface, Designing the User Interface, Creating forms and code modules, Aligning the controls.</p> <p>Managing Projects: Visual development and event-driven programming Common properties, Methods, Common events.-Customizing the environment Editor tabs, Format tab, General tab, Docking tab, Environment tab.</p> <p><b>Visual Basic Programming Elements:</b> Variables, Declaring variables, Data Types, Converting variables types, User defined data types, Forcing variables declarations, Scope of variables, Lifetime of a variable -Constants</p> <p>Collection objects, Arrays: Declaring Arrays, Sorting Arrays, Control Arrays, And</p>		

<p>Dynamic Arrays.</p> <p><b>Procedures:</b> Sub procedures, Function procedure, Control Structure: Control flow Statements, Looping Statements and iteration, Conditional Statements.</p> <p><b>The Input/Output:</b> Input Box, Output Box, Form Printing methods.</p> <p><b>Working with Forms :</b> The appearance of forms, Form properties, Events, Methods, Controlling one form within another</p> <p><b>Basic ActiveX Controls :</b></p> <p>The Textbox control,Basic properties, Manipulating the control's text, Text selection, Search and replace operations, Capturing keystrokes.</p> <p><b>List Box and Combo Box Controls:</b></p> <p>Basic properties, List box control's method, Arrows, Indexing with the List Box control, Searching a sorted list.</p> <p><b>Scrollbar and Slider controls:</b></p> <p>Scrollbar control, Scrollbar control's event, Timer Control.</p> <p>Graphics with Visual Basic :Form</p> <ul style="list-style-type: none"> <li>- Picture Box</li> <li>- Image Box controls</li> <li>- Setting picture and image properties</li> <li>- Exchange image through the clipboard</li> <li>- Coordinate systems Scale properties and methods.</li> </ul> <p><b>The Drawing Methods:</b></p> <p>Drawing text, Drawing lines, Drawing boxes, Circle Method, Drawing Modes, Drawing Curves, Manipulating pixels, Specifying colours, Specifying gradients, Using the Paint-Picture method, Processing images, Optimizing issues: refresh, Transparent Drawings.</p> <p><b>Manipulating Text:</b></p> <p>Working with files-file storing concept-record -field-I/O-types of files-opening and closing of files</p> <p>Database applications</p>		
<p><b>VB.Net</b></p>		
<p><b>Introduction--An overview of .NET frame work</b></p> <p><b>Variables and operators</b></p> <p><b>Control structures</b></p> <p><b>All windows forms</b></p> <p><b>Common Controls:</b> Button-Check Box-Checked List Box-Color Dialog-Combo Box-Date Time Picker-Label-Link Label-List Box-List View-Masked Text Box-Month Calendar-Notify Icon-Numeric Up Down-Picture Box-Progress Bar-Radio Button-Rich Text Box-Text Box-Tool Tip-Tree View-Web Browser</p> <p><b>Containers:</b> Flow Layout Panel-Group Box-Panel-Split Control-Tab Control-Table Layout Panel</p> <p><b>Menu &amp; Toolbars:</b> Context Menu Strip-Menu Strip-Status Strip-Tool Strip- Tool Strip</p> <p><b>Data:</b> Data Set-Data Grid View-Binding Source-Binding Navigator-Report Viewer</p> <p><b>Components</b></p> <p><b>Printing</b></p> <p><b>Dialogs:</b> Color Dialog-Folder Browser Dialog-Font Dialog-Open File Dialog</p>		

<p>Save File Dialog</p> <p><b>Crystal Reports:</b> Crystal Report Viewer-Report Document</p> <p>Built tin functions, Sub Procedures &amp;user defined functions: <b>String functions-</b> Compare,Concat, Join, Insert, Remove, Replace, ToUpper, ToLower, Format, Trim, TrimStart, TrimEnd, PadLeft, PadRight</p> <p><b>Math Functions-</b>Math.Ceiling, Math.Exp, Math.Log10, Math.Max, Math.Min, Math.Floor, Math.Round</p> <p><b>Validity Functions-</b> isNumeric , isDate , isCurrency , isAlpha</p> <p><b>Sub Procedures</b></p> <p><b>Functions</b></p> <p><b>Parameters</b></p> <p><b>User control:</b> User Control Basic-Creating User Control</p> <p><b>Class and modules:</b> OOP Basic-Class Declaration-Class Members- Fields, Properties, Methods, Events-Declaration type- Public, Private, Protected, Friend, Protected Friend-Object Creation</p> <p><b>Working with ADO.net: Evolution of ADO.NET-Why ADO.NET?-The ADO.NET Data Architecture-Data Set-Data Provider-Data access with ADO.NET-The Connection Object-The Command Object-The Data Reader Object-The Data Adapter Object</b></p>		
<b>Project:</b>		

## Course Outcome:

After studying this course, the students will be able to:

- Understand the basic concept of computer, OS/GUI.
- Understand the practical concepts of Ms Excel, MS Word, MS Power point, and MS Access.
- Understand the programming concepts and apply it practically.

### **Mode of Evaluation:**

Attendance, final theory examination and final practical examination

**Grading:**    A+ :  $\geq 80\%$   
                  A  :  $\geq 70\%$  to  $< 80\%$   
                  B  :  $\geq 60\%$  to  $< 70\%$   
                  C  :  $\geq 50\%$  to  $< 60\%$   
                  D  :  $\geq 40\%$  to  $< 50\%$

### **Resource Persons**

Mr. Prince Sebastian  
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Mr. Vince Sebastian  
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