

Tata Institute of Social Sciences- School of Vocational Education

1

DIPLOMA IN COMPUTER APPLICATIONS (DCA)



1. Introduction

In December 2011, Tata Institute of Social Sciences set up the **School of Vocational Education (SVE)** to provide immediate and definite interventions to improve the lives of the disadvantaged and marginalized youth, especially who are excluded by the formal school education system, through appropriate vocational training programmes. It has been set up with a vision of creating an ecosystem that would bring back the dignity of labour for blue collar streams of work and create sustainable sources of income. This project has been initiated under the aegis of **All India Council for Technical Education (AICTE)** proposed by the Ministry of HRD, Government of India.

1.1 Key Features:

Introduction and Course Objectives:

This program is aimed at training candidates for the job of Helpdesk Executive, Service Desk Executive, Technology Support Executive, IT Support Executive, and Helpdesk Coordinator in IT and ITES sector.

This course will also teach him in basic windows OS operation and management, working in and as a team, handle extremely stressful conditions and sharpen his decision making capabilities.

The Diploma program will provide a Platform for learner to start working in key areas of Industry

It helps in Developing Basic computer skills in student. It will provide an exposure of the IT Environment. The program will help in Learning Practical knowledge about computer and will make a candidate Job Ready for IT Industry

This course will also teach him in working in and as a team, handle extremely stressful conditions and sharpen his decision making capabilities.

The broad objectives of the course would be to create ready-to-be-employed workforce of lab technicians, who would be:

- Having a sound knowledge of the basic protocols and procedures of functioning
- Trained and skilled to execute the activities with strict adherence to rules and safety measures and execute the procedures with expertise
- Equipped with the right set of aptitudes and attitudes that would make them all encompassing Diploma In Computer Applications (DCA)

1.2. Eligibility for Admission

The candidate should have passed 10+2 in any discipline.

1.3. Employability/Skill enhancement

Undergoing the Diploma in Computer Applications will give the students, an upper hand in comparison to others as they will receive additional specialized training as follows:

- Basic understanding of computer and its terminology
- Manage, co-ordinate and resolve incidents as quickly as possible at primary support level.
- Dealing with basic service requests and incidents at the IT helpdesk
- Build and maintain positive and effective relationships with customers
- Problem-solving approaches in different situations
- Plan and organizing your work in order to complete it to the required standards on time.
- Work effectively with colleagues, either in your own work group or in other work groups within your organization.
- Analyze inputs from appropriate people to identify, resolve and record design defects and inform future designs
- Develop basic programming structures to implement functionality in line with requirements defined in BRS/URS, SRS and HLD
- Identify any problems you have working with colleagues and take the initiative to solve these problems
- Review codes and UTCs & execute UTCs for documenting results.

2. Semester wise Distribution of Credits

Semester wise Credit distribution of Credits						
Semester	Vocational Theory Credits	Vocational Theory Hours	Vocational Practical Credits	Vocational Practical Hours	Total Credits	Total Hours
Semester 1	10	150	10	300	20	450
Semester 2	8	120	12	360	20	480
Total	18	270	22	660	40	930

Theory 1 credit=15 hours

Practical 1 credit= 30 hours

3. Course Structure

Number of Credits - 40

Duration of Course – 930 Hours

Total number of Semesters – 2

S. No.	Topic/Module	Credits	Duration (Hrs)	• Key Learning Outcomes
1.	Fundamentals of Computers and Information Technology	2	30	<ul style="list-style-type: none"> • Understand the functions, characteristics & basic components of a computer system. • Know-how of various peripherals, storage devices & understand their physical structure & working. • Understand operating system & file system basics • Understand the difference between machines, assembly, High Level & 4 GL languages. • Understand & use computer networks
2.	Operating System- Windows	2	30	<ul style="list-style-type: none"> • Understand working of O.S. (Windows,), Network O.S, booting process & file system. • Installation & fine tuning of Windows 7 and 8 • Ability to use & work with Windows: accessories /programs & system tools. • Understand Login, Logout, file, directories & sub directories. • Work with advanced features of Windows • Ability to setup Dialup Network & internet connection with windows. • Familiar with Internet terminology and web browsing • Using internet function like e-mail, browsing searching, ftp etc
3.	Web Designing	2	30	<ul style="list-style-type: none"> • Introduce the basics of HTML tags. • Impart knowledge about Cascading Style Sheet (CSS). • To impart functional knowledge web hosting.
4.	Computers In Office Automation (MS Word, Excel& PowerPoint)	2	30	<ul style="list-style-type: none"> • Creation, edition, & printing a document/ page/ presentation/ excel sheet in MS Office. • Incorporate & use advanced features in MS Word. • Inserting word art, shapes, Clipart,

				<p>Charts, Smart arts, symbols, Graphs etc. in a document/slide.</p> <ul style="list-style-type: none"> • Calculations using various formulas, Function in Excel. • Using wizards various data types features with data, cell & texts. • Represent data as chart in MS Word, Excel & PowerPoint. • Design simple presentations using text, graphics, images, tables and charts. • Design presentations with advance features using animations & objects. 	4
5.	Programming Concepts & Techniques, Programming In C++	2	30	<ul style="list-style-type: none"> • Understand programming concept • Coding, debugging & testing of program. • Understand the difference between procedure oriented programming & OOP paradigm. • Understand concepts of OOPs. & its benefits. • Understand the methodology to solve the problem – algorithm, flowchart & coding. • Construct, compile, link & execute the C++ programs. • Familiarity with tokens, keywords, identifies, data types & various operators • Write & execute program using: - arithmetic operators/expression/character data type/ integer /float/etc. • Type compatibility, Declaring, & initializing variables. • Making an outside function inline. • Understand private member function, arrays in class & memory allocation for objects. • Write & execute program using classes & objects; constructors & destructors. • Function declaration and definition. • Understand difference between call by reference & return by reference, inline function. • Write & execute the programs using call by reference & return by reference; Inline functions, Default 	

				argument, const. Argument; function overloading, friend & virtual function.	5
				<ul style="list-style-type: none"> • Ability to overload unary operator, binary operator using friends in modifying & executing programs. • Understand various types of inheritance. • Modify a C++ Program file which uses :- • Derived class of single level inheritance. • Derived class constructors. • Derived class with multiple inheritances. • Class inside another class. • Distinguish between compile time & run time polymorphism. • Understand pointer, pointers to objects, to derived class & this pointer and C++ program using them. 	
6.	Vocational Practical-1	10	300	Practical will be conducted on the topics studied in this semester.	
7.	Communication And Personality Development	2	30	<ul style="list-style-type: none"> • Basic communication skills • Grooming • Communicate with colleagues clearly, concisely and accurately • Work with colleagues to integrate your work effectively with theirs • Follow organization's policies and procedures for working with colleagues • Provide different types of information that colleagues might need and know the importance of providing this information when it is required • Know the importance of understanding problems from your colleague's perspective and how to provide support. • Know the knowledge and skills required in your job role • Know your current learning and development needs in relation to your job role • Different types of learning styles and methods including those that 	

				help you learn best <ul style="list-style-type: none"> • Importance of taking responsibility for your own learning and development 	6
8.	Programming With Visual, Basic.Net	2	30	<ul style="list-style-type: none"> • Understand the features & architecture of .NET framework • Understand the event driven architecture. • Understand & use the various Windows application development tools. • Familiarity with visual studio, project basics & IDE of VB. NET. • Work with VB.NET language • GUI programming with Windows form • Use OOP in Visual Basic.Net • Database programming with ADO.NET 	
9.	Desktop Publishing with Adobe Illustrator	2	30	<ul style="list-style-type: none"> • Recognition of different traditional printing methods. • Format character & paragraph, placing image behind text. • Install & use different fonts & typeface. • Design, cards, letterheads, magazines etc. 	
10.	Internet & Web Technology	2	30	<ul style="list-style-type: none"> • Understand computer network concept (topologies, layers) • Describe various media & equipment used in networking. • Narrate evolution of internet, WWW- History & working. • Understand basics of web browsers, concepts of search engines and web protocols. • Use extensions & plug-ins of browsers - IE, Firefox, chrome. • Obtain an email address using web based and POP 3 email services. • Install & configure email client software. • Familiarity with the use of FTP. • Understand data transmission protocols, client-server architecture, FTP and its usages. • Use telnet with browser. 	

				<ul style="list-style-type: none"> • Understand “Use Net” & use browser as news group reader. • Use internet services like: Gopher, WAIS, ARICHE, Veronica. • Know about IRC, Its features, use & IRC servers. • Comprehend Unix/Linux & Windows based web servers like: PWS, IIS, Apache and Tomcat etc. • Setting up of firewalls on system • Understand & use various means of data security on internet. • Identify & distinguish basic syntax of internet languages like: HTML, DHTML, XML, .NET, PHP, JAVA, Java Script, AJAX, VB.NET, C# & CSS. 	7
11.	Vocational Practical-2	10	300	Practical will be conducted on the topics studied in this semester.	
12.	Project	2	60	<ul style="list-style-type: none"> • Basic experience and knowledge of application software dev./web dev./application dev. Working on below technologies <ul style="list-style-type: none"> ➤ C++ programming language: ➤ Programming With Visual Basic.Net ➤ Web designing ➤ Internet & Web Technology 	

Method of Teaching:

A combination of vocational theory inputs along with relevant practical exposure that would commensurate with the guidelines provided in the Facilitator’s guide.

Method of Assessment & Weightage:

The assessment of students would be done in written, oral and practical examination. The Assessment Weightage are as follows:

Written + Oral – 50%

Practical examination – 50%

Syllabus for Diploma in Computer Applications

Introduction:

This course intends to bring to the job market such professionals who are trained for the job of Helpdesk Executive, Service Desk Executive, Technology Support Executive, IT Support

Executive, and Helpdesk Coordinator in IT and ITES sector. The course is integrated program which includes practical along with the theory which helps the candidates to work easily in office environment.

The course also includes the module of Communication and Personality Development which trains the candidate how to communicate with colleagues clearly, concisely and accurately

Learning Objectives:

- Understand the functions, characteristics & basic components of a computer system.
- Work with advanced features of Windows
- Understand & use computer networks
- Ability to setup Dialup Network & internet connection with windows.
- Familiar with Internet terminology and web browsing
- Using internet function like e-mail, browsing searching, ftp etc
- Incorporate & use advanced features in MS Word.
- Understand programming concept
- Coding, debugging & testing of program.
- Basic communication skills
- Know the knowledge and skills required in your job role

Course Content:

- ❖ Fundamentals of Computers and Information Technology
- ❖ Operating System- Windows
- ❖ Web Designing
- ❖ Computers In Office Automation (MS Word, Excel & PowerPoint)
- ❖ Programming Concepts & Techniques, Programming in C++
- ❖ Vocational Practical- 1
- ❖ Communication And Personality Development
- ❖ Programming With Visual, Basic.Net
- ❖ Desktop Publishing with adobe illustrator
- ❖ Internet & Web Technology
- ❖ Vocational Practical- 2
- ❖ Project Work

DETAILED SYLLABUS

Course Title: DCA1 - FUNDAMENTALS OF COMPUTERS AND INFORMATION TECHNOLOGY

Credits: 2

Total Credit Hours: 30

Know the Computer - Introduction, What does computer stand for?, Strengths of computers, Limitations of computers, Fundamental uses of computers, Development of computers, Types of Computers, Generations of Computers

Personal Computer - Introduction, Personal computer, Uses of personal computers, Components of personal computers, Evolution of PCs, Developments of processors,

Architecture of Pentium IV, Configuration of PC

Input Devices - Introduction, Input Device, Typing Input Devices, Pointing Input Devices, Scanning Input Devices, Audio Visual Input Devices

Output Devices - Introduction, Output Devices, Soft Copy Vs Hard Copy Output, Monitor, Printers, Plotter, Electrostatic Technique, Special Purpose Output Equipments

Central Processing Unit - Introduction, What is Central Processing Unit, Arithmetic and Logic Unit, Control Unit, Registers, Instruction set, Processor Speed

Storage Devices - Introduction, Storage and its needs, Brain Vs Memory, Storage Evaluation Units, Data Access Methods, Primary Storage, Secondary Storage, Hard Disk Operations, Floppy Disk Drives, Winchester Disk, Optical Disk, VCD, CD-R, CD-RW, DVD, Zip Drive, Flash Drives, Blue Ray Disk, Memory Card, Driving Naming Conventions in a PC.

Basics of Software- Introduction, What Does Software Stand For ?, Needs of software, Types of software, Open Source Software, Integrated Development Environment

Operating System - Introduction, Operating System, Functions of Operating System, the Booting Process, Types of Reboot, Booting From Different Operating System, Types of Operating System, Some Prominent Operating Systems

Disk Operating System - Introduction, What is DOS?, Functions of DOS, Versions of DOS, DOS Commands , Important Internal Commands of DOS, Important External Commands of dos, Executable Vs Non-Executable Files In Dos

Programming Languages , Introduction, Data, information And Knowledge, Characteristics of Information, Comparison between human language and , Computer Language, What is a program?, What is a Programming language?, Programming development cycle, Algorithm, Program Flowcharts, Pseudo code, Programming approaches, Programming Paradigms, Types of Programming Language, Third Generation Language, Fourth Generation Language

Computer Virus - Introduction, Virus, History, Mechanism of virus, How A Virus Spreads , How is virus named, A few Prominent Viruses, Types of Computer Virus, Related Concepts, Anti Virus Programs, Norton Anti - Virus (NAV), Execution of Norton Anti-Virus

Communication and IT - Introduction, Computer Network, Communication Process, Communication Types, Transmission Media, Wireless Media, Communication Channels/Media, Modem, Characteristics of a Modem, Types of Modem

Networks - Introduction, Internet Vs Intranet, Types of Network, Topology, Types of Connectivity, Network Devices

Internet - Introduction, What is Internet actually ?, Growth of Internet, Owner of the Internet, Internet Service Provider, Anatomy of Internet, ARPANET and Internet history of the World Wide Web, Services Available on Internet (Internet Tools), Basic internet terminologies, Internet etiquette, Application of internet

Management Information System - Introduction, Information System, Management Information System (MIS), Fields of Information System, Elements Of MIS, Objectives Of MIS, Characteristics of MIS, Impact Of MIS, Designing An MIS, Placement Of MIS, Views Of MIS, Pitfalls In Designing an MIS, Advantages of MIS, Disadvantages of MIS

Applications of Computers and Information Technology - Introduction, Business and Computer, E-Mail, E-Commerce, Project management, Computers in Personnel Administration, Accounting, Computers in Cost and Budget Control, Marketing,

Manufacturing, Materials management, Banking, Insurance And Stock broking, Purchasing, Computers in warehousing

Course Title: DCA2 - OPERATING SYSTEM - WINDOWS**Credits: 2****Total Credit Hours: 30**

Fundamentals of operating system, definition and need. Main Services of operating system, various types of operating system, (definition and characteristics), multitasking, multiprocessing, multiprogramming, real time, time sharing, parallel, network operating system, booting process, file system.

WINDOWS -Introduction to Windows, its various versions and features. Hardware requirements for various versions of Windows. Working with Windows (**Windows 7** **Windows 8.1**) Windows concepts, Windows Structure, Desktop, Taskbar, Start Menu, Working with files and folders, create, copy, delete, renaming and moving files and folders, working with recycle bin, restoring deleted files, emptying the recycle bin, searching files and folders, My computer, formatting floppy disks, Using CDROM Disk and Drives.

Using Windows Accessories programs- Calculator, Notepad, Paint, WordPad, Character map, Paint, Command line.

Using Media Player, Sound Recorder, Volume Control, Taking Printout from programs, Printer Properties, Add fonts to Windows (Specially adding Hindi Fonts and using them), Setting up Region and Language settings in Windows.

Advance features of Windows -Managing Hardware & Software, Add or remove Hardware devices to/from computer, Add/remove programs, Using Scanner, Web camera, sharing of printers.

System Tools - Backup, Clipboard Viewer, Disk Defragmenter, Drive Space, Scandisk, System Information windows update.

Communication – Setting up Dial up Networking with Windows, Internet connection with Windows, Direct Cable Connection, Setting up TCP/IP properties, Hyper Terminal, Phone Dial, Browsing the Web with internet explorer, communication through Outlook Express, Multiple Users Features of Windows. Creating and deleting user, changing user password etc. Accessibility Features of Windows, Sharing Information between Programs, sharing folders and drives browsing the entire network, mapping windows shared drives, using shared printers, Understanding OLE, Embed/Link Using Cut and Paste and Embed/Link Using Insert Object - Manage Embedded/Linked Object.

Course Title: DCA3 – Web Designing

Credits: 2

Total Credit Hours: 30

11

Introduction HTTP, HTML, Basic HTML Tags, Body Tags, Coding Style, Modifying & formatting Text, Lists – Unordered, Ordered, Definition, Insert Links -Linking to another Document, Internal Links, Email Links, Relative and Absolute Links, Insert Images - Referencing Images, Clickable Images, Image Placement and Alignment, Image Size, Image Margins, Image Formats, Image Maps- Defining an Image Map, Advanced Coloring Body Content, Working with tables - Basic Tables, Table Attributes, Table Cell Attributes, Table Row Attributes, Tables Inside of Tables, Invisible Spacers, Working with Frame-Based Pages- Creating Windows, Single Window Frames, Creating Column Frames, Creating Row Frames, Creating Complex Frames.

Cascading Style Sheet (CSS) – Introduction, creating style, using inline and external CSS, Creating Divs with ID style, Creating Tag& Class style, creating borders, Navigation links, creating effects with CSS.

JavaScript – Introduction, use of JavaScript in webpages. Understand JavaScript event model, use some basic event and control webpage behavior.

DESIGNING WEBSITES WITH DREAMWEAVER/EXPRESSION Web/AMAYA/COFEE CUP WYSIWYG HTML Editor - Introduction to WYSIWYG HTML editor, advantages of using HTML editors, Creating a New Site, Creating a New Page, Adding Images with Alternate Text, Inserting & Formatting Text, Aligning Images, Creating an Email Link, Linking to Other Websites, Testing & Targeting Links, Organizing Files & Folders

CREATING & INSERTING IMAGES - Optimizing Images for the Web, Saving GIFs & PNGs in Photoshop, Inserting GIFs, Adjusting Transparency Settings, Saving JPGs for the Web

DESIGNING ACCESSIBLE TABLES - Understanding Tables & Accessibility, Using Tables for Tabular Data, styling a Table, Editing Table Layouts, Adding Style to a Table Using CSS

CREATING WEBSITES WITH FRAMES - Introducing Frames, creating a Frameset, Opening Pages into Frames, Controlling Scrollbars & Borders, Targeting Links in Frames

CUSTOMIZING THE INTERFACE - Opening an Existing Site, Reviewing Menu Options & Preferences, Comparing the Macintosh & PC Interfaces, Previewing in Browsers & Device Central

Introduction to Responsive Web Designing – Introduction, advantages, creating and using responsive web pages.

Web Hosting - What is Domain? Introduction to DNS, how to register a Domain? What is web hosting? How to get a web hosting? Host your website on web Server. FTP - FTP Introduction, FTP Commands Viewing Files and Directories, FTP Commands Transfer and Rename files, FTP with WS FTP/ CuteFTP, Filezilla on Windows.

**Course Title: DCA4 - COMPUTERS IN OFFICE AUTOMATION
(MS Word, Excel & PowerPoint)**

12

Credits: 2**Total Credit Hours: 30**

MS Word Basics: Introduction to MS Office; its components, Introduction to MSWord; Features & area of use. Working with MS Word; Menus & Commands; Toolbars & Buttons; Shortcut Menus, Wizards & Templates; Creating a New Document; Saving document, Saving as different format, Different Page Views and layouts; Applying various Text Enhancements; Working with – Styles, Text Attributes; Paragraph and Page Formatting- Using page border and watermark, Text Editing using various features; Bullets, Numbering, Auto formatting, word count, various page view options, Printing & various print options.

Advanced Features of MS-Word: Spell Check, Thesaurus, Find & Replace; Headers & Footers ; Inserting – Page Numbers, Pictures, Files, Auto texts, Symbols etc.; Working with section breaks and page breaks, Working with Columns, Tabs & Indents; Creation & Working with Tables including conversion to and from text; Margins & Space management in Document; Adding References – footnotes, endnotes, and Table of contents, Insert drawing, Mail Merge, Envelops & Mailing Labels, protect and secure documents in MS Word, Working in different languages in MS Word. Using Unicode in MS Word, Insert WordArt and other objects like shapes, clipart, charts and SamrtArts, symbol in Document. Using Macros in Word- Record, edit and run macros.

MS Excel: Introduction and area of use; Working with MS Excel.; concepts of Workbook & Worksheets; Using Wizards; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different Views of Worksheets; Zooming, Column Freezing, Labels, Hiding, Splitting etc.; Using different features with Data and Text; Use of Formulas, Calculations using various type of functions-Logical, string, date & time, maths and other types; Cell Formatting including Borders & Shading; conditional formatting, sorting data items, Working with Different Chart Types; Printing of Workbook & Worksheets with various options. Import and export excel sheets to/from various format, add headers and footers, using macros in excel sheet- Record, edit and run macros.

MS PowerPoint: Introduction & area of use; Working with MS PowerPoint; Creating a New Presentation; Working with Presentation; Using Wizards; Slides & it's different views; Inserting, Deleting and Copying of Slides; Working with Notes, Handouts, Columns & Lists; Adding Graphics, Sounds and Movies to a Slide; Working with PowerPoint Objects, Insert WordArt and other objects like shapes, clipart, charts and SamrtArts, symbol in PowerPoint, Designing & Presentation of a Slide Show; Master slide, Adding custom animation and effects in your presentation, Add time to your slide, Slide Sorting, Printing Presentations, Notes, Handouts with print options, Package your presentation for CD.

Course Title: DCA5- PROGRAMMING CONCEPTS & TECHNIQUES AND PROGRAMMING IN C++

13

Credits: 2**Total Credit Hours: 30**

Principles of Programming, Introduction to Programming, Program Concept, Characteristics of Programming, Stages in Program Development, Tips for Program Designing, Programming Aids, Algorithms, Notations, Design, Flowcharts, Symbols, Rules

Programming Techniques and Logic, Introduction, Introduction to programming techniques, Top-down approach or technique, Bottom-up approach or technique, Unstructured technique of programming, Structured technique of programming, Modular technique of programming, Comparative study of programming techniques, Cohesion , Coupling, Debugging , Syntax Errors, Logical Errors, Data Entry Errors, Linker Errors, Runtime Errors, Program Testing

Overview of C++- Overview of C++, Software crisis, Object oriented programming paradigm, Basic concepts of OOP, Advantages/Benefits of OOP, Usage/applications of OOP

C++ Environment- Program development environment, The language and the C++ language standards, Introduction to various C++ compilers, The C++ standard library, Prototype of main () function, i/o operator, manipulator, comments, data types

Creating and Compiling C++ Programs- TURBO C++ IDE, Creating, compiling and running a C++ program using IDE (integrated development environment) and through command line, Elements of C++ Language, Structure of a C++ program, C++ tokens, Type conversion in expressions

Decision Making and Branching - Introduction, Sequential statements, Mathematical Functions, Branching statements, looping Statements, Nested loops, Programming examples

Arrays and Functions- Arrays, The meaning of an array, Single-dimensional arrays, Two-dimensional arrays (Multi-dimensional arrays), User Defined Functions, Elements of user-defined functions, Return values and their types, Function calls, Categories of functions, Passing parameters to functions, Recursion, Command Line Arguments, Storage Class Specifiers

Classes and Objects - Classes, Structures and classes, Unions and classes, Friend function, Friend classes, Inline function, Scope resolution operator, Static class members, Static data members, Static member functions, Passing object to functions, Returning objects, Object assignment

Array, Pointers, References and the Dynamic Allocation Operators - Array of objects, Pointer to object, Type checking in C++, The this pointer, Pointer to Derived Types, Pointer to class members, References, C++'s Dynamic Allocation Operators

Constructors and Destructors - Introduction, Constructors, Default Constructor, Parameterized constructors, Copy Constructors, Multiple Constructors in a class, Constructors with default arguments, Default Arguments, Special Characteristics of Constructor functions, Destructors

Function and Operator Overloading - Function overloading, Overloading Constructor Function, Finding the address of an overloaded function, Operator Overloading, Creating a Member Operator Function, Creating Prefix and Postfix forms of the increment (++) and decrement (--) operators (Overloading Unary Operator), Overloading the Shorthand

Operators (i.e. +=, == etc), Operator Overloading Restriction (Rules), Operator Overloading using friend function, Overloading new and delete operator, Overloading some special operators, Overloading [] (Subscripting) operator, Overloading() (Function Call) operator, Overloading Binary Arithmetic operators, Concatenating String, Overloading Comma (,) operator, Overloading the I/O operators

Inheritance - Introduction to inheritance, Features or Advantages of Inheritance, Type of Inheritance :, Base Classes and Derived Classes, Base Class Access Control, Protected Members, Protected Base class Inheritance, Inheriting Multiple Base Classes, Constructors, Destructors and Inheritance, Passing Parameters to Base Class Constructors, Granting Access, Virtual Base Classes

Polymorphism - Polymorphism, Types of Polymorphism, Virtual Functions and Polymorphism, Pure Virtual Functions, Early Vs Late Binding

The C++ I/O System Basics - The C++ I/O System basics, C++ predefined streams, Formatting using the IOS members, Clearing Format Flags, An Overloaded form of set(), Examining the Formatted Flags, Using width(), Using precision(), Using fill(), Using Manipulators to format I/O, Creating your own Manipulators.

Course Title: DCA6 - Vocational Practical- 1

Credits: 10

Total Credit Hours: 300

Objective

To develop students' understanding of methods by which this knowledge has been gained, and grounds for confidence in it.

Outcomes

Practical will be conducted on the topics studied in this semester. It will be on below topics:

- Fundamentals of Computers and Information Technology
- Operating System- Windows
- Web Designing
- Computers In Office Automation (MS Word, Excel& PowerPoint)
- Programming Concepts & Techniques, Programming In C++

Course Title: DCA7 - COMMUNICATION AND PERSONALITY DEVELOPMENT

Credits: 2

Total Credit Hours: 30

Grammar:

Parts of Speech - Articles and Determines, Noun and Pronoun, Adjective and Adverb, Verb, Conjunctions and Prepositions, Tenses, Punctuations, Active & Passive Voice, Type of Sentences (simple, complex, compound), Reported Speech (direct and indirect), Types of Sentences, Prepositions, -Gerunds, -Infinitives,

Written English:

Advance Writing Skills (formal, informal paragraph, story, letter, applications)

Personality development: Soft Skills Development, Body Language, Behavioural and Symptomatic Soft Skills, Etiquette and Manners, Positive Thinking, Motivation, Goal setting, Team building, Self Confidence, Leadership Skills, Time Management

Course Title: DCA8 - PROGRAMMING WITH VISUAL, BASIC.NET

Credits: 2

Total Credit Hours: 30

Introduction to .NET - Introduction, What is a Program?, What is Programming?, What do you mean by .NET Framework?, Features of .NET Framework, VB 6 VS VB.NET, VB.NET VS JAVA, VB.NET VS C#, What is .NET Architecture?, What is CLR?, What do you mean by Class Library?, Versions of .NET Framework, What are Assemblies?, Namespaces, CTS (Common Type System), Interfaces, What is special in VB.NET?

Visual Studio 2005 - Introduction, What is Visual Studio?, Flavors of Visual Studio, Visual Studio 2005, File Extensions Used in VB.Net, Using Visual Studio 2005, Feature of Visual Studio 2005, Output Window, Components Tray, References and the Reference Window, Quick View of Visual Studio 2005, Opening an existing project, Adding a Form to a Project.

The Visual Basic Language - Visual Basic Statements, Data Types in VB.NET, Declaring Variables, Declaration of Variables (Advanced), Data Type Conversion, String Functions, Formatting Data, Arithmetic Operators, Parentheses and Precedence, Operator Operation, Constants, Control Statements, Arrays in VB.NET, Specifying Optional Procedure Arguments, Passing a Variable Number of Arguments, Recursion, Using a Delegate

Working With The Controls - The Toolbox, Adding and deleting Tools in the Toolbox, creating a tab on the toolbox, Form Designer Basics, The Button, The ComboBox, The ListBox, The Checkbox, The PictureBox, The RadioButtons, The Scroll Bar, Timer, ListView, TreeView, Toolbar, Dialog Boxes, Menus in VB.NET, LinkLabel Control

Designing Menus - Menus, Context menu, Event of the MenuItem, Creating menu items in Visual Studio .Net

Object Oriented Programming with VB.NET - OOPs?, What is an Object?, What are Classes?, Visual Basic .NET and Object-Oriented, Principles of Object-Oriented Programming, Classes V/s Objects, Inheritance, Polymorphism and Overloading, Scope and Accessibility in Class Modules, Namespaces, Managed Execution, Assemblies, Assemblies in VB .NET

The .NET Framework Class Library - The .NET Framework Class Library, The System Namespace, Data Type Conversion Using Convert Class, The Array Class, The Math Class, The String Class, Other Namespaces, System.Collections, System.Data, System.IO

OLE/COM/Win32 API - Object Linking and Embedding, History of OLE/COM, Component Object Model (COM), COM interoperability in .NET, Win32 API in .NET, COM Interoperability in .NET, Installation and Registration of Assembly, Microsoft Office solutions with Visual Studio .NET, Automation of Office from Visual Studio .NET, Creating and opening Microsoft Word document from VB.NET

User Controls in VB.NET - Introduction, The Control Class, The Control Class' Properties, The Control Class' Methods, Creating the Control Project 1, The RoundButton Control,

Creating the Control Project 2, Building the new Button

A Brief Introduction to Database Access with VB .NET - Introduction, What is ADO?, What is ADO.NET?, The Connection Object, Connecting to a Database, The Command Object, The DataAdapter Object, The DataReader Object, The DataSet Object, Updating Your Database by Using DataSets, The AcceptChanges () Method, The RejectChanges () Method, The HasChanges () Method, The GetChanges () Method, Working with DataSets in Visual Studio, Moving Around in DataSet and Retrieving Data, Using Strongly Typed DataSets, DataSets With Multiple Tables, Finding and Sorting Data in DataSets, Filtering on Row State and Version, Data View Manager

Graphics In VB.NET - Introduction, Service of GDI+, Using GDI+ Manged Classes, BRUSH Class, Bitmap Class, Graphics Class, Simple Drawing, Drawing Text, An Example: Show All Fonts, Printing, Printing Multiple Pages, More on the PrintPageEventArgs Class, Using a Print Dialog Control, Rolling Your Own Printing Code, Print Preview

Course Title: DCA9- Desktop Publishing with Adobe Illustrator

Credits: 2

Total Credit Hours: 30

INTRODUCTION - Traditional Publishing, Advantage of Desk Top Publishing over traditional publishing methods, History of Desk Top Publishing, Desktop Publishing on Computers, The Macintosh System, DTP on the IBM PC With Windows, Hardware and Software Required for the DTP, Software requirement for Desk Top Publishing, Review Question,

FONTS AND TYPEFACES - Introduction, Type Faces, Characteristics Of A Typeface, Typeface Families, Font versus Typeface, Characters in a font, Measurement Units of Fonts, Font Classifying Type, Basic Typeface Groups, Serif Vs Sans Serif, Other Typefaces, Selecting a Typeface, Select a Point Size, Font Type, Printer Driver Languages – PostScript & PCL, Encapsulated Postscript Files (EPS), Font Formats, Fonts for Indian languages, Installing PostScript Type , TrueType and OpenType Fonts, Review Question,

TEXT GENERATION AND PROOF READING - Introduction, Text Generation, ASCII Text Editors (Plain Text Editors), Notetab Light, SciTE, Typing Special Characters, Word Processors, Advantages of Word Processors Over Plain Text editing, Unicode text editor, Typing in Indian Language, The Remington Layout, Inscript Keyboard (DOE Layout), Optical Character Recognition (OCR), Effect Of Various Factors On Page Layouting, Alignments, Hypnation, Widows and Orphan, Proof Reading, Advantages of Proof reading, Orientation and Size of Paper, Factors of Selecting Proper Typeface, Impact of Special Effects, Using All Capitals, Monospace and Proportional fonts, Reversed Text, Using Bold and Italic, Wrapping Text, Special Effects, Capital Letters, First Big Letter, Bullets, Borders, Shades and Tints, Review Question,

GRAPHICS - Introduction, Graphics, Creating Graphics on Computers, Advantages of using computer graphics, Vector and Raster Graphics, Draw Programs, Paint Programs, Creating Bitmap Graphics, Image Capturing Devices, Scanner, Digital Camera, Video Cameras, Review Questions,

IMAGE CAPTURING - Introduction, Capturing Windows Full Screen, Capturing Active Window, Pasting Information From The Clipboard, Saving Information On The Clipboard,

CLIPART AND PRINTERS - Introduction, Electronic Clip Art, Printers for DTP, Bit-Mapped Fonts, Print Controller, Toners, Resolution, Printing in Color, Color Printing, Color Theory, Pantone Colors, Color Separations, Using Color Separations, Using Spot Colors with Separations, Designing with Color, Color Gradients and Fountains, Color Text Effects, Review Question.

Adobe Illustrator

Whats's new

New features summary

Workspace

Workspace basics, Customizing the workspace, Tools, Tool galleries, Improved User Interface, Safe Mode, Recover document data after a crash, Touch Workspace, Artboard overview, Rulers, grids, guides, and cropmarks, Custom Tools Panels, Viewing artwork, Setting preferences, Slicing and cutting tool gallery, Using multiple artboards, Recovery, undo, and automation, Working with Connect Now, Files and templates, Import and export illustrator CC settings, File info dialog

Drawing

Drawing basics, Drawing with the Pen, Pencil, or Flare tool, Drawing simple lines and shapes, Editing paths, Drawing pixel-aligned paths for web workflows, Adjust path segments, Pen tool rubber-band preview, Curvature Tool, Using Image Trace, Enhanced Pencil Tool, Anchor Point enhancements, Symbols, Symbolism tools and symbol sets, Perspective drawing, About perspective Grid, Using Live Trace / CSS and earlier, Automatic corner generation / illustrator CC, Creating arrows and arrowheads in illustrator

Color

About color, selecting colors, Using and creating swatches, Color groups (harmonies), Create color themes with Kuler, Color Themes panel, Adjusting colors

Painting

About painting, Painting with fills and strokes, Live Paint groups, Brushes, Transparency and blending modes, Gradients, Gradient panel and Gradient tool overview, Patterns, Meshes, Stroke an object, Create and edit patterns, Apply or edit gradient, Images in brushes / illustrator CC

Selecting and arranging objects

Selecting objects, Grouping and expanding objects, Moving, aligning, and distributing objects, Rotating and reflecting objects, Layers, Locking, hiding, and deleting objects, Duplicating objects, Stacking objects

Reshaping objects

Transforming objects, Scaling, shearing, and distorting objects, Reshape using envelopes, Combining objects, Cutting and dividing objects, Clipping masks, Building new shapes using the Shape Builder tool, Live Rectangles and Rounded Rectangles, Working with live Corners, Blending objects, Enhanced reshape workflows with touch support, Reshaping objects with effects, Creating 3D objects, Touch-based tools and enhancements / illustrator CC, Creating shapes using Shape Builder Tool.

Importing, exporting, and saving

Importing artwork files, Importing bitmap images, Importing Adobe PDF files, Importing EPS, DCS, and Auto CAD files, Importing artwork from Photoshop, Saving artwork, Package files, Unembed images, Share on Behance, Creating Adobe PDF files, Adobe PDF options, Exporting artwork, File information and metadata, Export SVG graphics styles in CSS / Illustrator CC, Extract CSS / Illustrator CC, Links information, Place multiple files / Illustrator CC

Type

Importing and exporting text, Creating text, Creating type on a path, Scaling and rotating type, Spelling and language dictionaries, Fonts, Find missing fonts (Typekit workflow), Text enhancements, Working with Typekit Fonts, Arabic and Hebrew type, Line and character spacing, Tabs, Special characters, Formatting Asian characters, Formatting type, Formatting paragraphs, Hyphenation and line breaks, Updating text from Illustrator 10, Character and paragraph styles, Creating composite fonts, Indic support with new Composers / Illustrator CC

Creating special effects

Appearance attributes, working with effects, Summary of effects, Create a drop shadow, Drop shadows, glows, and feathering, Creating sketches and mosaics, Graphic styles

Web graphics

Best practices for creating webgraphics, Slices and image maps, SVG, Creating, animations

Printing

Setting up documents for printing, Change the page size and orientation, Printing color separations, Printer's marks and bleeds, Post Script printing, Printing with color management, Printing and saving transparent artwork, Printing gradients, meshes, and color blends, Overprinting, Trapping print presets, Specify crop marks for trimming or aligning, White overprint / Illustrator CC

Automating tasks

Automation with actions, Automation with scripts, Data-driven graphics through templates and variables

Graphs

Creative Cloud Charts (Preview) and Graphs

Keyboard shortcuts

Customizing keyboard shortcuts and Default keyboard shortcuts

Course Title: DCA10 - INTERNET & WEB TECHNOLOGY

Credits: 2

Total Credit Hours: 30

Introduction To Internet- Introduction, what is internet actually ?, growth of internet ,

owner of the internet, internet service provider, anatomy of internet, Arpanet and internet history of the world wide web, services available on internet wais , basic internet terminologies, net etiquette, applications, commerce on the internet, governance on/through the internet, impact of internet on society

TCP/IP - Internet Technology And Protocols-introduction, switching technology,internet protocols, overview of TCP/IP reference model, introduction to TCP/IP, routers, internet addressing scheme

Internet Connectivity - connectivity types, level one connectivity, level two connectivity, level three connectivity, hardware requirements, modems, narrow-band/phone-line dialup modems, software requirements, modem configuration:, telephone line options, making a dial-up connection, protocol options, service options, news services, desktop alerts

InternetNetwork- computer networks,applications of networks,commonterminologies :, interoperability, network security, the need for security, common threats, security barriers in network pathways, network components : communication media, network devices, types of network : client / server & peers, addressing in internet, domain name system (DNS), domain name and their organization, network topology, internet vs. intranet

Services Of Internet (Definition And Functions) - introduction, file transfer protocol, ftp related terminologies, ftp servers and authentication, public and private software services, ftp clients, types of ftp client software, displaying files, remote login, chat programs, connecting to a server, search engines

Electronic Mail - introduction, what is an e-mail?, email networks and servers, merits of e-mail, limitations, e-mail protocols, structure of an e-mail, e-mail address, Microsoft internet explorer and outlook express, applying stationary, web based emails, working with yahoo, starting the mail program, creating signature in outlook express, creating signature in yahoo, email encryption, why email encryption?, digital certificate

Current Trends On Internet -current trends of internet, languages used on the internet, internet phones, internet video / internet TV, streaming video & audio, collaborative computing, e-commerce, technical and organizational aspects

Web Publishing- overview, SGML (standard generalized markup language), what is the need of a website? , types of web sites, components of web publishing, domain name planning and registration, choosing a web host and signing up for an account, web hosting, web design and development, testing your website, promotion of the site, registering your site with a search engine, publishing tools, html editor, image editor, program to transfer your files to a web server, uploading web pages using CuteFTP

World Wide Web- introduction , evolution of the www, basic features, mechanism of the world wide web, search and meta-search engines, searching the web, using Boolean operators in your searches, using advanced , using a Metasearch engine, site specific search tools, web protocols, hyper text transfer protocol (http), web server

Browsers- introduction, www web browsers, Mozilla Firefox browser, the opera browser, google chrome, what are bookmarks?, adding folders, favorites, deleting favorite folders and pages, history, progress indicator, customizing internet explorer, turning off graphics to display all web pages faster, customizing the toolbar, copying, saving and printing in internet explorer, printing an image from a web page, printing a web page, cookies, what is cache setting ?, internet explorer, the standard toolbar, internet explorer keyboard shortcuts

Hyper Text Markup Language Programming Basics - introduction, html editors, elements of html, definition lists , compact attribute, nested list, type attribute, html links, using alt

attribute, background graphics, html document tables, creating tables within tables, html frames, html rules, introduction of multimedia, meaning of multimedia, what is multimedia ?, identifying multimedia elements, audio on the web, video on the web

Introduction To Interactivity Tools- overview, what is ASP?, functions of asp, the basic syntax rule , writing output to a browser, adding some html to the text, declaring a variable in asp, declaring an array in asp, what is VBScript?, java, features of java, starting with java, Javascript and java, syntax and conventions, FrontPage, introduction to flash, installation of flash MX, creating simple animation for the web, working with layers in flash, masking in flashmx, bouncing effect in flash, to create motion tween, flash ripple effect

Internet Security Management Concepts, Information Privacy And Copyright Issues - overview , basic security concepts, security events, measures for check threats, firewalls , monitoring tools, security analysis tools, cryptography , information privacy, copyrights and the internet, copyright legislation in India, key points of copyright, encryption & decryption - cryptography, terminology

Data security measures on internet

Firewalls - firewalls, firewall design principles, firewall attributes, firewall strengths and weaknesses, types of firewalls, comparison of firewall types, DMZ DNS server, VLAN

Course Title: DCA11 - Vocational Practical- 2

Credits: 10

Total Credit Hours: 300

Objective

To develop students' understanding of methods by which this knowledge has been gained, and grounds for confidence in it.

Outcomes

Practical will be conducted on the topics studied in this semester. It will be on below topics:

- Communication And Personality Development
- Programming With Visual, Basic.Net
- Desk Top Publishing with Adobe Illustrator
- Internet & Web Technology

Course Title: DCA12 - Project

Credits: 2

Total Credit Hours: 60

Objective

The objective of project is to measure the performance of the students.

Timeline and Instructions:

Each student has to complete a project in second semester. Actual time allotted for project is

60 hours. As far as possible individual projects are to be allotted to students. However, in case of larger project two or three student can work in a group. In such a case each student should work on a separate or distinct module. Student should submit the project individually. The project report submitted by the student shall be evaluated separately by the internal guide and the external examiner appointed by the university.

Outcomes

After completing the project successfully every student must be capable of working in any one of the below mentioned technologies on his/her own:

- **C++ programming language:**
 - Capable of writing C++ programs
 - Use common software patterns in object-oriented design and recognise their applicability to other software development contexts

- **Programming With Visual Basic.Net:**
 - Capable of writing vb.net code
 - Create a new project using VB.Net language in visual studio.

- **Web designing:**
 - Must be capable of designing web pages.
 - Must be able to use different editors for website designing
 - Understand concepts of Web Hosting

- **Internet & Web Technology**
 - Setup a LAN in office/organization/institute to disseminate information/app/internet services within organization.

Reading Lists & References

S. No.	Subject	Reference Books
1.	Fundamentals of Computers and Information Technology	<ul style="list-style-type: none"> • Fundamentals of Computers Paperback, Reema Thareja, Oxford, 2014 • Computer Fundamentals, Kogent Learning Solutions Inc., Dreamtech Press • Fundamentals of Computers and Information System, Niranjana Shrivastava, KLSI, Dreamtech Press
2.	Operating System- Windows	<ul style="list-style-type: none"> • Windows 8 Absolute Beginner's Guide, Paperback, Paul Sanna, Pearson Education • Windows 8.1 In Depth, Brian Knittel, Pearson Education • Computer Course : Windows 7 and Office 2010, Ravikant Taxali, Tata McGraw Hill
3.	Web design	<ul style="list-style-type: none"> • HTML: The Complete Reference by Thomas A. Powell, Osborne/McGraw-Hill • HTML5 and JavaScript Projects, by Meyer (Author), Publisher: Springer India Private Limited
4.	Computers In Office Automation (MS Word, Excel & PowerPoint)	<ul style="list-style-type: none"> • Computer Course : Windows 7 and Office 2010, Ravikant Taxali, Tata McGraw Hill • Office 2013 All-In-One Absolute Beginner's Guide, Paperback, Patrice-Anne Rutledge, Pearson Education • Microsoft Office 2010: On Demand, Paperback, Steve Johnson, Pearson Education
5.	Programming Concepts & Techniques, Programming In C++	<ul style="list-style-type: none"> • Object Oriented Programming with C++, 6th Ed., E Balagurusamy, Tata McGraw Hill • Programming in C++, 2/e, Paperback, Ashok Kamthane, Pearson Education • Object Oriented Programming in C++, 4/e, Robert Lafore, Pearson Education • Object Oriented Programming in C++, Thampi, Mantha, KLSI, Dreamtech Press
6.	Communication And Personality	<ul style="list-style-type: none"> • Personality Development and Communication Skills - I & II, Dr. C.B. Gupta, Jain Book Agency

	Development	
7.	Programming With Visual, Basic.Net	<ul style="list-style-type: none">• Visual Basic .NET Programming Black Book, Steven Holzner, Dreamtech Press• Visual Basic.NET, ShirishChavan, Paperback, Pearson Education
8.	Desk Top Publishing with adobe illustrator	<ul style="list-style-type: none">• Illustrator CC: Visual QuickStart Guide Publisher: Peachpit Press
9.	Internet & Web Technology	<ul style="list-style-type: none">• Web Technologies, Black Book, As Per Mumbai University Revised Syllabus, Kogent Learning Solutions Inc., Dreamtech Press

PCTI Ltd.