Course Name : Diploma in Computer Applications (DCA)

Course Code : A06

Eligibility : 10+2

Fee : Rs 14,000/-
Duration : 12 Months (600 Hrs)

Semester 1: 275 Hrs

Subject code	Subject	Topics	T	P	Total Dur.Hrs.	Total Marks	Exam Dur.
DCA01	Computer Fundamentals	**Computer Fundamentals-** • **Introduction to computers,** characteristics of computer; History ofcomputers; Classification of computers on size: (Micro, Mini, Mainframe and super computers), • **Working Principles, Generations;** Applications of computers; commonly usedterms– Hardware, Software, Firmware. • **Basic Computer Organization:** Block diagram ofcomputer	60	40	100	100	3

		system, Input unit, Processing Unit and Output Unit. • **Description of Computer input devices:** Keyboard, Mouse, Trackball, Pen, Touch screens, Scanner, Digital Camera; **Output devices:** Monitors, Printers, Plotters. • **Computer Memory-** Representation of information: BIT, BYTE, Memory, Memory size; • **Units of measurement of storage;** Main memory: Storage evaluation criteria, main memory organization, RAM, ROM, PROM, EPROM; • **Secondary storage devices:** Sequential Access Memory,					

		Direct Access Memory Magnetic Tapes, Magnetic disks, Optical disks: CD, DVD; • **Memory storage devices**: Flash Drive, Memory card; • **Types of software**: System and Application software; Programming Languages: Generation of Languages; Translators - Interpreters, Compilers, Assemblers and their comparison. • **OperatingSystem-** operating system basics, Purpose of the operating system, types of operating system, providing a user interface, Running Programs, Sharing Information					

		• **Managing Hardware,** Enhancing an OS with utility software.					
		• **DOS** – Introduction to DOS and versions of DOS, Booting sequence; Warm and Cold Boot					
		• **Types of DOS commands:** Internal Commands: DIR, MD,CD, CLS, COPY, DATE, DEL, PATH,PROMPT, REN, RD, TIME, TYPE, VER, VOL;					
		• **External Commands:** XCOPY, ATTRIB, BACKUP, RESTORE, FIND, SYS, FORMAT,CHK DSK, DISKCOPY, MOVE, TREE,DEFRAG, SCANDISK,UN DELETE.					
		• **Batch Files:** Introduction to simple batch files; Introduction to CONFIG.SYS And AUTOEXEC.BA T files.					

		UNIX – • **Overview of Unix** History of Unix Features of Unix Unix versus Windows • **Structure of Unix and File System** Unix Layers and Unix File system • **Unix Basic commands** File & Directory manipulative commands, Changing password and logging commands					
DCA02	MS Office	**MS – WORD** • **Basics of Word Processing:** creating, opening, saving, and printing document, Menu Toolbars. • **Editing Text**: Copy, Paste, Delete, Move etc., Finding and Replacing Text, Spell Check, Autocorrect feature, language setting and thesaurus • **Formatting:** Character, Paragraph and Page formatting, working with indents, • **Bulleted and numbered lists,** adding Headers	35	65	100	100	3

		and Footers, setting up Multiple Columns					
		• **Working with tables:** Inserting/creating table using toolbar and drawing, formatting table, adding/ deleting rows/columns, Applying borders to tables					
		• **Clipart:** Using clip art, Creating Word Art					
		• **Mail merge:** Creating merged envelops, creating merged mailing labels					
		MS EXCEL					
		• **Worksheet overview**: Row, Column, Cells, Menus, creating, opening, saving, and printing worksheet; working with Range					
		• **Editing information:** Entering text, numbers and formulae, AutoSum, AutoFill, spell Checking					
		• **Working with Functions:**					

		Statistical, Mathematical and String functions, date and Time functions, Trigonometric functions • **Working with charts**: Line graphs, Pie charts, Bar graphs, adding Titles, Legends etc. to charts, Printing Charts **MS POWERPOINT** • Basic features, selecting design templates, creating, saving and printing a simple presentation, various views, Adding pictures, shapes, clipart, audio and movie.					
DCA03	Data Base Management System	**DBMSConcept** – • Data Base Vs File Oriented Approach, Basic DBMS terminology, • Data Independence, General Architecture of a Data Base Management • Software, Components of DBMS, Advantages and Disadvantages of DBMS. • Distributed Databases,	30	45	75	100	3

		Structure and Design of Distributed Databases. **Database Design** • Introduction to Data Models, Entity Relationship Model, Entities, Attributes, • E-R Diagrams, Conceptual Design of a relational data base model. **Relational Model:** • Storage organization for Relations, Relational Algebra, Relational • Calculus, Functional dependencies, multivalued dependencies, Candidate Key and Primary Key in a Relation, Foreign Keys • Normalization - Introduction, 1NF, • Partial Dependencies, 2N, data Anomalies in 2NF Relations, Transitive Dependencies 3NF **Understanding SQL-1:**						

		- Data Types, Creating Tables, Creating a Table with data from Another table - Inserting Values into a Table, Updating Column(s) of a Table, Deleting Row(s) from a Table - Dropping a Column, Querying database tables, - Conditional retrieval of rows, Working with Null Values, Matching a pattern from a table - Functions: Character Functions, Date Functions, Group Functions, - Ordering the - result of a Query Aggregate Functions, Grouping the Result of a Query. **Fill exposure of Access** **Creating and Managing Databases in MS Access** - Starting and setting up a new					

| | | database in MS Access
- Creating a database from templates vs. creating from scratch
- Database objects: Tables, Queries, Forms, Reports, and Macros
- Navigating and managing database objects
- Saving and opening database files

Queries in MS Access

- Introduction to Queries and their purpose
- Types of queries: Select, Action (Update, Delete, Append), Crosstab, Parameter
- Designing and running Select queries
- Using the Query Design grid
- Filtering and sorting data in queries
- Using criteria, wildcards, and expressions in | | | | | |
|---|---|---|---|---|---|---|---|

		queries • Joining tables in queries **Forms in MS Access** • Introduction to Forms and their purpose in a database • Creating simple forms for data entry • Customizing form layouts using Form Design View • Adding controls (text boxes, combo boxes, buttons) to forms • Using Form Wizards to generate forms automatically • Setting properties of form fields (default values, validation rules) • Creating subforms to display related data **Reports in MS Access** • Introduction to Reports and their purpose					

		• Creating basic reports using Report Wizard • Designing reports using Report Design View • Formatting reports (grouping, sorting, and summarizing data) • Adding headers, footers, and calculated fields in reports • Previewing and printing reports **Importing and Exporting Data** • Importing data from external sources (Excel, CSV, other databases) • Exporting Access data to Excel, PDF, or other formats • Linking Access to external databases or data sources • Working with ODBC (Open Database					

		Connectivity)					
		Total	125	150	275	300	

Semester II :325Hrs

Subject code	Subject	Topics	T	P	Total Dur.Hrs.	Total Marks	Exam Dur.
DCA04	Programming Language	Programming Language C++ - **1. Introduction to C++ Programming** • History of C++ and its Evolution from C • Overview of Procedural vs Object-Oriented Programming • Structure of a C++ Program • Basic Syntax: main(), Input/Output (cin, cout), Preprocessor Directives • Compiling and Running a C++ Program **2. C++ Basics** • Data Types and Variables • Constants, Literals, and Enumerations	40	60	100	100	3

		• Operators in C++: Arithmetic, Relational, Logical, Assignment, Bitwise, and Miscellaneous Operators • Input and Output in C++ (cin, cout, manipulators like endl, setw) • Typecasting and Implicit/Explicit Conversions **3. Control Structures** • Conditional Statements: if, else, else if, switch • Looping Constructs: for, while, do-while • Break, Continue, and Goto Statements • Nested Loops and Conditional Statements **4. Functions** • Function Declaration and Definition					

		- Function Prototypes - Parameter Passing: Pass by Value, Pass by Reference, and Pass by Pointer - Default Arguments - Inline Functions - Function Overloading - Recursion **5. Object-Oriented Programming (OOP) Concepts** - Introduction to OOP and its Principles (Encapsulation, Abstraction, Inheritance, Polymorphism) - Defining Classes and Objects - Access Specifiers: public, private, protected - Defining Member Functions - Inline Functions in Classes - this Pointer					

		6. Constructors and Destructors • Constructors: Default, Parameterized, Copy Constructor • Constructor Overloading • Destructors: Purpose and Use • Dynamic Initialization of Objects **7. Inheritance** • Basics of Inheritance • Types of Inheritance: Single, Multiple, Multilevel, Hierarchical, Hybrid • protected Access Modifier • Constructor and Destructor Calls in Inheritance • Function Overriding • Using the super Keyword						

		8. Polymorphism • Compile-time Polymorphism (Function Overloading, Operator Overloading) • Runtime Polymorphism (Virtual Functions) • Pure Virtual Functions and Abstract Classes • Pointers to Objects and this Pointer • Dynamic Method Dispatch **9. Operator Overloading** • Basics of Operator Overloading • Overloading Unary Operators and Binary Operators • Friend Functions • Rules for Operator Overloading						

		10. Pointers and Dynamic Memory Management					

10. Pointers and Dynamic Memory Management

- Introduction to Pointers
- Pointer Arithmetic
- Pointers and Arrays
- new and delete Operators for Dynamic Memory Allocation
- Pointers to Objects
- this Pointer

11. Arrays and Strings

- Arrays: Single-Dimensional and Multidimensional Arrays
- Array of Objects
- Strings in C++: C-style Strings vs String Class
- String Manipulation Functions (strcpy, strcmp, strlen, etc.)
- Using String Class

		12. File Handling in C++ • Introduction to File I/O in C++ • File Streams (ifstream, ofstream, fstream) • Reading and Writing to Files • File Modes and Operations (open, close, read, write) • Binary File Handling **13. Exception Handling** • Introduction to Exception Handling • Try, Catch, and Throw Statements • Types of Exceptions • Handling Multiple Exceptions • Using finally Block (or its C++ equivalent) **14. Templates** • Function Templates					

		• Class Templates • Templates with Multiple Parameters • Use of Templates in C++ Standard Template Library (STL) **15. Standard Template Library (STL)** • Introduction to STL • Components of STL: Containers, Iterators, and Algorithms • Using STL Containers (vector, list, deque, stack, queue, map, set) • Iterators in STL • Algorithms in STL **16. Namespaces** • Introduction to Namespaces • Defining and Using Namespaces • std Namespace and the Standard C++					

		Library					
		17. Command-Line Arguments • Using Command-Line Arguments in C++ • Writing Programs that Accept Command-Line Inputs Practical on C ++ Programming, Practical on Application Program					
DCA05	Java	Fundamentals of Oops and Core Java– **1.Basic Concepts of Object-Oriented Programming** • (Objects and Classes, Data abstraction and encapsulation, Inheritance, Polymorphism, Dynamic binding, Message communication) Difference between procedure oriented and object oriented approach, Benefits of OOP's; Applications of	40	35	75	100	3

		OOP's, Object-Oriented languages.					
		2. Object oriented programming with JAVA: • Byte code, Java virtual machine, Java Development Kit, java tokens, constants, variables, data types, operators, expressions, • control structures, defining class, creating objects, accessing class members, method over loading, static members. **3. Inheritance:** • Defining a subclass, subclass constructor, multilevel inheritance, • Hirerchical inheritance. Overriding methods, Final variables, methods, and classes, Abstract Methods and Classes. **4. Visibility Control:** • Public access, friendly access,					

		protected access, private access, private protected access.					
		5. Arrays:					
		• One dimensional array, declaration, creation and initialization of arrays, Array length, Two dimensional array					
		6. Strings:					
		• String arrays, String methods, String Buffer class					
		7. Interfaces:					
		• Defining interfaces, Extending Interfaces, Implementing Interfaces. Accessing Interface variables.					
		8. Packages:					
		• Java API packages, Defining a package, Creating and Accessing packages,					
		• Adding class to a package, Hiding Classes.					

9. Multithreaded Programming:

- Creating Thread, Extending the Thread class, Stopping and Blocking a Thread, Life cycle of a Thread.

10.Errors and Exception Handling:

- Fundamentals, error types, exception types, using Try and catch, finally statement, Built–in exceptions.

11. Applet

- Programming: Local and remote applets, Applet Life Cycle, Creating an executable Applet, Applet tag, Adding Applet to a HTML file, Passing parameters to Applets

ProjectJava

DCA06	Internet and Web Page Designing	**Internet and Web Page Designing**- **1.Basic Terminology:** • Web Server;	40	60	100	100	3

		Web Client/Browser, Understanding how a Browser communicates with a Web Server, Website, Webpage, Static Website, Dynamic Website, Internet, Intranet, Extranet, WWW, **2.URL HTML:** • Structure of an HTML program, Paragraph Breaks, Line Breaks; Emphasizing Material in a Web Page (Heading Styles, Drawing Lines); Text Styles (Bold, Italics, Underline); Other Text Effects (Centring (Text, Images etc.) Lists: Unordered List,					

		Ordered Lists, Definition lists Adding Graphics to HTML Documents using the Border, Width, Height, Align, ALT Attributes Tables: Caption Tag, Width, Border, Cell padding, Cell spacing, BGCOLOR, COLSPAN and ROWSPAN Attributes.					

3.WorldWideWeb (WWW) –

1. Introduction to WWW

- What is the World Wide Web?
- History and evolution of the web
- Differences between the Internet and the World Wide Web
- Web browsers and web servers
- URL, Domain

		Names, and DNS					
		2. Web Protocols					
		• HTTP/HTTPS protocols • Request/Response cycle • Cookies and Sessions • Introduction to FTP (File Transfer Protocol)					
		Web Publishing –					
		1. Introduction to Web Publishing					
		• Definition and scope of web publishing • Overview of websites, blogs, and portals • Difference between static and dynamic websites • Web publishing workflow and lifecycle • Roles in web publishing (content creators, designers,					

		developers, etc.)					
		2. Basics of HTML & CSS for Web Publishing • HTML overview (Basic tags and attributes) • Creating simple web pages • CSS fundamentals (styling web pages) • Linking external CSS to HTML • Styling text, images, and layout management **3. Content Management Systems (CMS)** • Introduction to CMS • Overview of popular CMS platforms (Word Press, Joomla, Drupal) • Features of a CMS (themes, plugins, extensions) • Setting up a					

		website using a CMS • Publishing and managing content with CMS **4. Web Design Principles** • Basic web design principles (color schemes, layout, typography) • User Interface (UI) and User Experience (UX) considerations • Mobile-first design and responsive design • Web Accessibility guidelines (WCAG) • Introduction to web design tools (Adobe XD, Figma, etc.) **5. Web Hosting and Domain Management** • Overview of					

		web hosting and domain registration • Types of web hosting services (Shared, VPS, Cloud, Dedicated) • How to register a domain name • Connecting domain names with hosting servers • Uploading files to the web server (FTP basics) **6. Multimedia in Web Publishing** • Incorporating multimedia (images, videos, audio) • Image formats and optimization for the web • Embedding videos (YouTube, Vimeo, etc.) • Using web tools to create interactive multimedia content (Canva,					

		etc.) • Best practices for multimedia web content **7. Introduction to SEO (Search Engine Optimization)** • What is SEO and its importance in web publishing? • On-page SEO basics (meta tags, keywords, URLs) • Off-page SEO basics (backlinks, social signals) **8. Web Publishing Tools and Platforms** • Web publishing tools (Adobe Dreamweaver, Microsoft Expression Web) • Online publishing platforms (Medium, WordPress.com , Blogger) • Website builders (Wix, Squarespace,						

		Weebly) • Publishing workflows and automation tools • Introduction to version control (Git and GitHub basics) **9. Web Security and Legal Considerations** • Website security basics (SSL, HTTPS, site backup) • Handling website vulnerabilities and common threats • Copyright and intellectual property for online content • Privacy policies and terms of service for websites • Compliance with data protection laws (GDPR) HTML5 **1. Introduction to HTML5**					

		• Evolution of HTML and the need for HTML5 • Key differences between HTML4 and HTML5 • Structure of an HTML5 document • Basic tags and structure (doctype, head, body) • Semantic elements in HTML5 (header, footer, article, section, aside, etc.) **2. HTML5 Document Structure** • Understanding HTML5 syntax and rules • Declaring metadata using `<meta>` tags • Defining page structure using new semantic elements • Compatibility and fallback for older browsers • Best practices for creating					

		clean, well-structured HTML5 documents					
		3. HTML5 Text Formatting and Links					
		• Text formatting tags (headings, paragraphs, bold, italics, lists) • Adding links (anchor tag `<a>`, relative and absolute URLs) • Working with email and telephone links • Use of internal linking (within the same page)					
		4. HTML5 Forms and Input Types					
		• Creating forms (form, input, textarea, select, button) • New HTML5 input types (email, date, color, range, etc.) • Form validation using HTML5					

		attributes (required, pattern, etc.) • Placeholder text and autofocus attributes • Using `datalist` for auto-suggestions **5. HTML5 Graphics and Multimedia** • Embedding images (`<img>` tag) and image formats (JPG, PNG, SVG) • Audio and Video embedding using HTML5 (`<audio>` and `<video>` tags) • HTML5 `<canvas>` element for 2D graphics • Basic drawing on the `<canvas>` using JavaScript (lines, shapes, text) • Working with SVG (Scalable Vector Graphics)						

		6. HTML5 APIs Overview • Introduction to HTML5 APIs • Geolocation API: Retrieving and using a user's location • Web Storage API: LocalStorage vs SessionStorage for persistent data • Offline Web Applications: Using `cache manifest` for offline support • Drag and Drop API: Implementing drag-and-drop functionality in web pages **7. HTML5 Multimedia** • Integrating audio into web pages using `<audio>` tag • Video embedding and control using `<video>` tag • Adding subtitles to video using					

		the `<track>` element • Use of media formats for HTML5 (MP4, Ogg, WebM) **8. HTML5 Responsive Web Design** • Introduction to responsive design • Media queries in HTML5 and CSS3 • Viewport meta tag and its importance for mobile devices • Flexible grid layouts using percentage widths • Using the `<picture>` element for responsive images **9. HTML5 with CSS3 and JavaScript** • Integrating CSS3 for styling HTML5 elements • Applying CSS3 animations and					

		transitions to HTML5 elements • Introduction to JavaScript and DOM Manipulation with HTML5 • Handling events in HTML5 using JavaScript (click, load, etc.) • Using HTML5 data attributes (`data-*` attributes) for dynamic content					
DCA07	Project&Viva	Using any Language of the course	-	50	50	100	-
Total			120	205	325	400	