



महात्मा गांधी अंतरराष्ट्रीय हिंदी विश्वविद्यालय, वर्धा

सूचना एवं भाषा अभियांत्रिकी केंद्र
पी.जी.डी.सी.ए. पाठ्यक्रम

Post Graduate Diploma in Computer Application

Semester I

PGDCA 01 Fundamentals of Computer - 4 credits

PGDCA 02 Introduction to Operating Systems -4 credits

PGDCA 03 PC Packages- 4 credits

PGDCA 04 C Programming- 4 Credits

Semester II

PGDCA 05 System Analysis and Design-4 credit

PGDCA 06 Object Oriented programming-4 credit

PGDCA 07 Database Programming-4 credit

PGDCA 08 Internet and Web Page Designing -4 credit

PGDCA 09 Project -4 credit

PGDCA 10 Viva -4 credit

Total 40 credits

PGDCA 01 Fundamentals of Computer 4 credits

UNIT-I

Brief History of Development of Computers, Computer System Concepts, Computer System Characteristics, Capabilities And Limitations, Types of Computers, Basic Components of A Computer System - Control Unit, ALU, Input/output Functions and Characteristics, Memory RAM, ROM, EPROM, PROM and other types of Memory

UNIT II

Input/Output & Storage Units:- Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, scanners, Digital Camera, MICR, OCR, OMR, Barcode Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc

UNIT III

Printers And Its Types -Dot Matrix, Inkjet, Laser, Plotter, Sound Card And Speakers, Storage Fundamentals - Primary Vs Secondary Data Storage And Retrieval Methods - Sequential, Direct And Index Sequential, Various Storage Devices - Magnetic Tape, Magnetic Disks, Hard Disk Drives, Floppy Disks ,Optical Disks, Flash Drives Video Disk, MMC Memory Cards, Physical Structure of Floppy & Hard Disk, Drive Naming Conventions In PC.

UNIT IV

Use of Communication and IT, Communication Process, Communication Types- Simplex, Half Duplex, Full Duplex, Serial And Parallel Communication, Types Of Network - LAN, WAN, MAN ,Internet, Topologies of LAN - Ring, Bus, Star, Mesh And Tree Topologies, Components of LAN -Media, , World Wide Web and Applications and Internet Services.

Text and Reference Books

Sinha, P.K.(2007). Computer Fundamentals. New Delhi: BPB Publications. Mukhi, Vijay (2008).Working with UNIX. New Delhi: BPB Publications. Rajaraman, V. (2014). Fundamental of Computer. New Delhi: Prentice Hall India Pvt. Limited.

Outcomes

1. Understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
2. Understand the difference between an operating system and an application program, and what each is used for in a computer
3. Describe some examples of computers and state the effect that the use of computer technology has had on some common products

PGDCA 02 Introduction to Operating Systems 4 credits

UNIT I

DISK OPERATING SYSTEM (DOS): Introduction, History & Versions of DOS, DOS Basics - Physical Structure of Disk, Drive Name, FAT, File and Directory Structure and Naming Rules, Booting Process, DOS System Files. DOS Commands: Internal - DIR, MD, CD, RD, COPY, COPY CON, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE, VER etc. External - CHKDSK, XCOPY, PRINT, DISKCOPY, DOSKEY, TREE, MOVE, LABEL, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB, HELP, SYS etc, Executable V/s Non Executable Files in DOS.

UNIT II

WINDOWS XP: Introduction to Windows XP and its Features, Hardware Requirements of Windows. Windows Concepts, Windows Structure, Desktop, Taskbar, Start Menu, My Pictures, My Music, My Documents, Working with Recycle Bin - Restoring a deleted file, Emptying the Recycle Bin. Managing Files, Folders and Disk - Navigating between Folders, Manipulating Files and Folders, Creating New Folder, Searching Files and Folders. My Computer - Exploring Hard Disk, Copying and Moving Files and Folder from One Drive to Another, Formatting Floppy Drive, Windows Explorer and its Facilities, Using Floppy, CD, DVD, Pen Drive, Burning CD. Windows Accessories - Calculator, Notepad, Paint, WordPad, Command Prompt. Entertainment Media Players, Sound Recorder, Volume Control, Movie Maker.

UNIT III

ADVANCED FEATURES OF WINDOWS XP: Managing Hardware & Software - Installation of Hardware & Software, Using Scanner Web Camera, Printers. System Tools - Backup, Character Map, Clipboard Viewer, Disk Defragmenter, Drive Space, Scandisk, System Information, System Monitor, Disk Cleanup, Using Windows Update. Browsing the Web with Internet Explorer,

Multiple User Features of Windows, Creating and Deleting User, Changing User Password, etc. Accessibility Features of Windows - Sharing Folders and Drives, Browsing the Entire Network, Using Shared Printers. OLE - Embed/Link Using Cut and Paste an Embed/ Link, Using Insert Object Manage Embedded/Linked Object.

UNIT IV

LINUX: History & Features of Linux, Linux Architecture, File System of Linux, Hardware Requirements of Linux, Various flavors of Linux, Linux Standard Directories, Functions of Profile and Login Files in Linux, Linux Kernel. Text and Reference Books DOS Quick Reference By Rajeev Mathur, Galgotia Publications Linux Complete by BPB Publications Peter Norton: Complete Guide to Linux Tech Media Publication Windows XP Complete Reference, BPB Publication

Outcomes

1. Describe and explain the fundamental components of a computer operating system.
2. Analyze the structure of OS and basic architectural components involved in OS design
3. Understand and analyze theory and implementation of: processes, resource control, physical and virtual memory, scheduling, I/O and files

PGDCA 03 PC Packages 4 credits

UNIT I

Office Packages: Office activates and their software requirements, Word-processing, Spreadsheet, Presentation graphics, Database, introduction and comparison of various office suites like MS-Office, LotusOffice, Star-Office, Open-Office etc.

MS Word Basics: Introduction to MS Office, Introduction to MS Word, Features & area of use. Working with MS Word, Menus & Commands, Toolbars & Buttons, Shortcut Menus, Wizards & Templates, Creating a New Document, Different Page Views and layouts, Applying various Text Enhancements, Working with -Styles, Text Attributes, Paragraph and Page Formatting, Text Editing using various features ; Bullets, Numbering, Auto formatting, Printing & various print options.

UNIT II

Advanced Features of MS-Word: Spell Check, Thesaurus, Find & Replace; Headers & Footers, Inserting - Page Numbers, Pictures, Files, Autotexts, Symbols etc., Working with Columns, Tabs & Indents, Creation & Working with Tables including conversion to and from text, Margins &

Space management in Document, Adding References and Graphics, Mail Merge, Envelops & Mailing Labels. Importing and exporting to and from various formats.

UNIT III

MS Excel: Introduction and area of use, Working with MS Excel, Toolbars, Menus and Keyboard Shortcuts, 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, Column Freezing, Labels, Hiding, Splitting etc., Using different features with Data and Text, Cell Formatting including Borders & Shading,

UNIT IV

MS PowerPoint: Introduction & area of use, Working with MS PowerPoint, Creating a New Presentation, Working with Presentation, Using Wizards; Slides & its 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, Designing & Presentation of a Slide Show, Printing Presentations, Notes, Handouts with print options.

Text and Reference books

Windows XP complete Reference, BPB Publication

MS OFFICE XP Complete BPB Publication

MS WINDOWS XP Home Edition Complete, BPB Publication.

Outcomes

Upon completion of the course students will be able to

1. Recognize when to use each of the Microsoft Office programs to create professional and academic documents.
2. Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.
3. Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace.
4. Identify categories of programs, system software and applications. Organize and work with files and folders.

PGDCA 04 C Programming 4 credits

UNIT I

History of C, where C stands C character set, tokens, constants, variables, keywords, identifiers, C operators- arithmetic, logical, assignment, relational, increment and,decrement, conditional, bit wise, special, operator precedence, C expressions data types. Problem solving techniques : flowchart and algorithm, Formatted input, formatted output instructions.

UNIT II

Decision making and branching if-statement – if, if-else, else-if ladder, nested if else, switch case statement, break statement, Decision making and looping - while, do, do- while statement, for loop, continue statement.

UNIT III

Arrays Declaration and initialization of one dimensional, two Dimensional and character arrays, accessing array elements. Declaration and initialization of string variables, string handling functions from standard library – strlen(), strcpy(), strcat(), strcmp().

UNIT IV

Functions: Need of functions, scope and lifetime of variables, defining functions, function call, call by value, call by reference, return values, storage classes. Category of function: No argument No return value, No argument with return value, argument with return value, recursion, command line arguments, Structures: Defining structure, declaring and accessing structure members, initialization of structure, arrays of structure.

Text and Reference books

Programming in C Paperback – 2011 by J.B. Dixit

Programming in ANSI C by Balagurusamy

Outcomes

1. Illustrate the flowchart and design an algorithm for a given problem and to develop I C programs using operators
2. Develop conditional and iterative statements to write C programs
3. Exercise user defined functions to solve real time problems
4. Inscribe C programs that use Pointers to access arrays, strings and functions.
5. Exercise user defined data types including structures and unions to solve
6. Inscribe C programs using pointers and to allocate memory using dynamic memory management functions.
7. Illustrate flowchart and algorithm to the given problem

Semester II

PGDCA 05 System Analysis and Design 4 credits

UNIT I

System Concept: Definition, Characteristics, Elements of system, Physical and abstract system, open and closed system, System Development Life Cycle: Various phases of system development, Considerations for system planning and control for system success. System Planning.

UNIT II

Initial Investigation: Determining Users Requirements and Analysis, Fact Finding Process and Techniques. Feasibility Study: Determination of Feasibility Study, Technical, Operational & Economic Feasibilities, Data Analysis, Cost and Benefit Analysis.

UNIT III

Initial Investigation: Determining Users Requirements and Analysis, Fact Finding Process and Techniques. Feasibility Study: Determination of Feasibility Study, Technical, Operational & Economic Feasibilities, Data Analysis, Cost and Benefit Analysis.

UNIT IV

User Manual, Programming Manual, Programming Specifications, Operator Manual. System Testing & Quality: System Testing and Quality Assurance, Software Maintenance. System Security: Data Security, Disaster/ Recovery Threat and Risk Analysis. 8 8 UNIT-V Organization of EDP: Introduction. Job Responsibilities & duties of EDP Personnel's- EDP manager, System Analyst, Programmers, Operators etc. Essential features in EDP.

Text and Reference books

Modern Systems Analysis and Design -Jeffrey A. Hoffer
Systems Analysis and Design - Gary B. Shelly

Outcomes

Upon successful completion of this course, you will be able to

1. Gather data to analyze and specify the requirements of a system.
2. Design system components and environments.
3. Build general and detailed models that assist programmers in implementing a system.

PGDCA 06 Object Oriented programming 4 credits

UNIT-I

Principles of Object-oriented Programming, Object-Oriented Programming Paradigm, Basic Concepts of Object Oriented Programming, Benefits of OOPs, Object-Oriented Languages, Applications of OOP, C++ Statements, Class, Structure of C++ Program, Creating the Source File, Compiling and Linking.

UNIT II

Tokens, Expressions And Control Structures, Introduction, Tokens, Keywords, Identifiers, Basic Data types, User Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialisation of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Dereferencing Operators, Manipulators, Type Cast Operator, Expressions and Implicit Conversions, Operator Precedence, Control Structures.

UNIT-III

Specifying a Class, Defining Member Functions, Making an Outside Function Inline, Nesting of Member Functions, Private Member Function, Arrays within a Class, Memory Allocation for Objects, Static Data Member, Static Member Functions, Arrays of Objects, Object as Function Arguments. Constructors And Destructors Introduction, Constructors, Parameterized Constructors, Multiple Constructors with Default Arguments, Dynamic Initialisation of Objects, Copy Constructors, Dynamic Constructors, Destructor.

UNIT-IV

Functions in C++, 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 - introduction, methods, binary versus unary operators Inheritance: Extending Classes Introduction, Defining Derived Classes, Single Inheritance, Making a Private Member Inheritable, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance.

Text and Reference books

Let us C++ by Yashawant Kanetkar

Object Oriented Programming with C++ - by Balagurusamy

Outcomes

1. Understanding of modular programming by designing programs that require the use of programmer-defined functions.
2. Understanding of arrays by designing and implementing programs that search and sort arrays.
3. Understanding of the object-oriented programming concepts of encapsulation, data abstraction and composition by designing and implementing classes including the use of overloaded functions and constructors.
4. Understanding of the concept of pointers by designing and implementing programs using pointers.
5. Understanding of the implementation of programmer-defined functions and classes by writing code, performing unit testing and debugging of multiple complex programs.
6. Demonstrate a thorough understanding of stream input/output for both console and files.
7. Demonstrate an understanding of the differences between C and C++ in the areas of strings, pass by reference/passing pointers, and struct by designing and implementing programs that use C strings, C++ strings, C language structs and classes.

PGDCA 07 Database Programming 4 credits

Unit-I

SQL Basic A Brief History of SQL, RDBMS, Creating Database, Table, adding record, T-SQL, Expression, T-SQL variable, T-SQL Function, String, Math function, aggregate•Constants, function, Date Time function, conversion function, T-SQL – flow control – if ...else, case, while, Go To and return.

Unit -II

SQL Command DDL Command, DCL command, MDL command, TCL command, Select, having, group by join.

Unit-III

RDBMS/DBMS Package Introduction to My SQL, Installation, PHP My Admin, Introduction to MS – SQL server, SQL server management, Studio.

Unit - IV

Data Integrity Database and Table integrity, Entity integrity, Referential integrity, Transaction integrity, Default, Value, Check, constraints, foreign key, Primary key, Triggers, Altering Triggers, Dropping Trigger. Text Book Bayross, Ivan. Mastering Database Technologies. New Delhi : BPB Publications. Silberschatz, A. , Korth, H. F. & Sudarshan, S.(2006). Database System Concepts., New Delhi : McGraw Hill.

Text and Reference books

Database System Concepts by Silberschatz

Database Management System by Schaum Series

Outcomes

Upon successful completion of this course, students should be able to:

1. Describe the fundamental elements of relational database management systems
2. Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
3. Design ER-models to represent simple database application scenarios
4. Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.
5. Improve the database design by normalization.
6. Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B tree, and hashing.
7. Students can design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

PGDCA 08 Internet and Web Page Designing 4 credits

Unit - I

Internet • Evolution, Protocols, Interface Concepts, Internet Vs Intranet, Growth of Internet, ISP, Connectivity – Dial-up, Leased line, VSAT etc. URLs, Domain names, Portals, Application.EMail • Concepts, POP and WEB Based E-mail, merits, address, Basic of Sending & Receiving, Email Protocols, Mailing List, and Free E-mail services, FTP.

Unit - II

World Wide Web (WWW) , History, Working, Web Browsers, Its functions, Concept of Search Engines. Searching the Web, HTTP, URLs, Web Servers, Web Protocols.

Unit - III

Web Publishing Concepts, Domain name Registration, Space on Host Server for Web site, HTML, Design tools, HTML editors, Image editors, Issues on Web site creations & Maintenance, FTP software for upload web site.

Unit - IV

HTML Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and

Colour controls, Different HTML tags, Table layout and presentation, Use of font size & Attributes, List types and its tags.

Text Books

Pawel, Thomas A(2010).

HTML Complete Reference. New Delhi: Tata McGraw Hill.

Web & Graphics .New Delhi: B.P.B Publisher.

Singh, Minakshi & Singh, VishnuPriya. Web Designing Course. Delhi : Asian Publisher.

Outcomes

1. Understand the principles of creating an effective web page, including an in-depth consideration of information architecture.
2. Become familiar with graphic design principles that relate to web design and learn how to implement theories into practice.
3. Develop skills in analyzing the usability of a web site.
4. Learn the language of the web: HTML and CSS.
5. Learn techniques of responsive web design, including media queries.
6. After completion of this course, student will be able to develop static web sites.

PGDCA 09 Project -4 credit

PGDCA 10 Viva -4 credit