

NIMS UNIVERSITY, JAIPUR



SYLLABUS

**POST GRADUATE DIPLOMA IN
COMPUTER APPLICATION**

POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS

S.NO	YEAR-1	Theory	Practical
1.	FUNDAMENTALS OF COMPUTERS & INFORMATION TECHNOLOGY	100	-
2.	OPERATING SYSTEMS	100	50
3	PC PACKAGES	100	50
4	FOXPRO	100	50
5.	PROGRAMMING WITH VISUAL BASIC.NET	100	50
6	INTERNET & E-COMMERCE	100	50
7	SYSTEM ANALYSIS AND DESIGN	100	-
8	Data Structures & Programming with C	100	50

FUNDAMENTAL OF COMPUTERS AND INFORMATION TECHNOLOGY

UNIT 1	Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitations, Types of computers Generations of computers, Personal Computer (PCs) – evolution of PCs, configurations of PCs- Pentium and Newer, PCs specifications and main characteristics. 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 2	Input/Output & Storage Units:-Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code 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, Printers& types – Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers, Storage fundamentals - Primary Vs Secondary Data Storage and Retrieval methods - Sequential, Direct and Index Sequential, SIMM, Various Storage Devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive, flash drives Video Disk , Blue Ray Disc, SD/MMC Memory cards, Physical structure of floppy & hard disk, drive naming conventions in PC. DVD, DVD-RW.
UNIT 3	Software and its Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Introduction to operating system for PCs- DOS Windows, Linux, File Allocation Table (FAT & FAT 32), files & directory structure and its naming rules, booting process details of DOS and Windows, DOS system files Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits, Application Software and its types - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Uses and examples and area of applications of each of them, Virus working principles, Types of viruses, virus detection and prevention, viruses on network
UNIT 4	Use of communication and IT , Communication Process, Communication types- Simplex, Half Duplex, Full Duplex, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication, Modem - Working and characteristics, Types of network Connections - Dialup, Leased Lines, ISDN, DSL, RF, Broad band ,Types of Network - LAN, WAN, MAN ,Internet, VPN etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN -Media, NIC, NOS, Bridges, HUB, Routers, Repeater and Gateways.
UNIT -5	Computer Applications in Business-Need and Scope, Computer Applications in Project Management, Computer in Personnel Administration, Information System for Accounting-Cost and Budgetary Control, Marketing and Manufacturing, Computer Applications in Materials Management, Insurance and Stock-broking, Production planning and Control, Purchasing, Banking, Credit and Collection, Warehousing. Use of computers in common public services and e-governance.

TEXT & REFERENCE BOOKS:

- Anurag Seetha, **“Introduction to Computers and Information Technology”**, Ram Prasad & Sons, Bhopal.
- S.K.Basandra, **“Computers Today “**, Galgotia Publications.
- Alexis Leon & Mathews Leon, **“Fundamentals of Information technology “**, Vikas Publishing House, New Delhi.

OPERATING SYSTEMS

UNIT 1	DISK OPERATING SYSTEMS (DOS) Introduction, History & versions of DOS basics- Physical structure of disk, drive name, FAT, file & directory structure and naming rules, booting process, DOS system files. DOS commands: Internal - DIR, MD, CD, RD, COPY, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE etc. External - CHKDSK, XCOPY, PRINT, DISKCOPY, DISKCOMP, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB, HELP, SYS etc Executable V/s Non executable files in DOS.
UNIT 2	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.,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 ,coping and moving files and folder from one drive to another, formatting floppy drive. Windows Accessories - Calculator, Notepad, Paint, WordPad,Character map,paint,command prompt Windows Explorer - -exploring hard disk ,coping and moving files and folder from one drive to another, formatting floppy drive. and other Explorer facilities. burning CD Entertainment- CD player, DVD Player, Media Player, Sound Recorder, Volume Control, movie maker
UNIT 3	ADVANCED FEATURES OF WINDOWS XP Managing Hardware & Software - Installation of Hardware & Software, Using Scanner web camera, printers sharing of printers System Tools - Backup, Character map, Clipboard Viewer, Disk Defragmenter, Drive Space, Scandisk, System Information, System Monitor, Drive converter (FAT 32) ,disk cleanup ,using Windows update. Communication - Dial up Networking, Direct Cable Connection, 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 a Embed/Link Using Insert Object Manage Embedded/Linked Object
UNIT 4	LINUX <ul style="list-style-type: none"> • History & Features of Linux • Linux Structure

	<ul style="list-style-type: none">• File system of Linux• Hardware requirements of Linux• Various flavours of Linux• Program & Process• Process creation and process identifiers• Functions of profile and login files in Linux• Linux kernel
UNIT-V	<ul style="list-style-type: none">• Multi-user features of Linux• Login and logout from Linux system• Linux commands - bc, cal, cat, cd, chgrp, chmod, chown, clear, cmp, copy, date, find, ps, kill, ls, mail, mkdir, more, mv, rm, rmdir, tty, wc, who, whois, grep, write, telnet.• Pipeline concepts• Using floppy and cdrom in linux.• vi editor

TEXT & REFERENCE BOOKS:

- DOS Quick reference by Rajeev Mathur, Galgotia Publications
- Linux Complete by BPB Publications
- Peter Norton Complete Guide to Linux by Peter Norton, Techmedia Publications
- Level Module M 1.1 Information technology by Khanna Book Publications, NewDelhi
- **Windows XP Complete Reference. BPB Publications**

PC PACKAGES

UNIT 1	<p>Office Packages-Office activities and their software requirement, word Processing, spreadsheet, presentation graphics, database, introduction and comparison of various office suites like MS office, Lotus Office, Star Office, Open Office etc.</p> <p>MS Word Basics: Introduction to MS Office; Introduction to MSWord; 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</p>
UNIT 2	<p>Advanced Features of MS-Word: Spell Check, Thesaurus, Find & Replace; Headers & Footers ; Inserting – Page Numbers, Pictures, Files, Auto texts, 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.</p>
UNIT 3	<p>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; Column Freezing, Labels, Hiding, Splitting etc.; Using different features with Data and Text; Use of Formulas, Calculations & Functions; Cell Formatting including Borders & Shading; Working with Different Chart Types; Printing of Workbook & Worksheets with various options.</p>
UNIT 4	<p>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.</p>
UNIT 5	<p>Outlook express: Setup email account with outlook, sending and receiving mail through outlook, concepts of CC and BCC, forwarding mail, Draft messages, formatting e-mail message, Concept of MIME Protocol, attaching files and items into messages, inserting hyperlink using outlook editor creating and using send and receive groupemails, opening received messages, opening messages with attachment, replying to mail forwarding messages flagging for further action, setting email options, managing contacts with outlook, Setting up multiple email accounts on single machine.</p>

Text & Reference Books:

- Windows XP Complete Reference. BPB Publications**
- MS Office XP complete BPB publication**
- MS Windows XP Home edition complete, BPB Publications**
- I.T. Tools and Applications, A. Mansoor, Pragya Publications**

FOXPRO

UNIT 1	<p><i>FOXPRO - THE RDBMS FOR PC</i></p> <p>FoxPro - Versions, features, requirement of Hardware and Software FoxPro - Menu System, Working with FoxPro Creating Database File Some common operations on data- CREATE, LIST, APPEND, CLOSE, QUIT</p> <p>FoxPro - Data Types</p> <p><i>VIEWING AND EDITING DATA</i></p> <p>Data Displaying and Monitoring Commands - DISPLAY, LIST, LOCATE, EDIT, CHANGE, BROWSE, REPLACE, DELETE, RECALL, PACK (All Commands with various Options)</p> <p><i>MODIFY STRUCTURE, MEMO FIELD AND FILE UTILITIES</i> - File utilities in FoxPro - DISPLAY DIRECTORY, COPY, DELETE, and RENAME.</p>
UNIT 2	<p><i>SORTING AND INDEXING OF DATABASE FILES</i></p> <p>Sorting & Indexing Concept</p> <p>Sort Commands - Single & Multiple Key</p> <p>Advantage & Disadvantages of Sort</p> <p>Indexing Vs Sorting, Single & Multiple Key</p> <p>Indexing, FIND, SEEK, Rushmore Technology</p> <p><i>PRINTING REPORTS AND LABELS</i></p> <p>FoxPro Report - its creation, features & Utilities, Preview, Printing Custom Report, grouping & Subgrouping.</p> <p>FoxPro Label - Designing & Printing</p>
UNIT 3	<p><i>MEMORY VARIABLES, DATE & TIME FUNCTIONS AND KEYBOARD MACROS</i></p> <p>Memory Variables - Creation and Uses, Simple Vs Array</p> <p>Saving and Restoring Memory Variables, ?/??/??? Commands</p> <p>Time & Date Functions and Commands, Date Arithmetic</p> <p>Converting Defining Function Keys</p> <p>Keyboard Macros - Creating and Using</p> <p><i>MATHEMATICAL COMMANDS AND FUNCTIONS</i></p> <p>Arithmetic Operations, Mathematical Functions, Mathematical Commands, Statistical Functions.</p>
UNIT 4	<p><i>PROGRAMMING WITH FOXPRO</i></p> <p>Concepts of FoxPro commands file, Modify Commands</p> <p>Conditioning , Branching and Looping within Program files with Do-While Enddo, If - Endif, Scan-Endscan, For - Endfor, Dcase-Endcase, Text - Endtext, Executing Commands from other command files, Macro Substitution</p> <p><i>ERROR CONDITIONS AND PROGRAM DEBUGGING AIDS</i></p> <p>Common Error Messages</p> <p>Debugging techniques and commands</p>
UNIT-V	<p><i>MULTIPLE DATA FILES</i></p> <p>Concept of Multiple Database Files - Using multiple database files</p> <p>Relationing the database - SET RELATION, UPDATE, APPEND FROM, COPY TO, JOIN, Relation Query by Example and SQL</p> <p><i>CUSTOM SCREENS & USER DEFINE FUNCTIONS & OTHER TOOLS</i></p>

	Create Custom Screen with @, @_GET, @_EDIT, _SAY_GET_READ, Creating Box & Lines, User Define Functions, Custom Screen Designing and their Use, FoxDoc for documentation
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TEXT & REFERENCE BOOKS:

- Foxpro Made Simple by R.K.Taxali, BPB Publications
- Mastering Foxpro 2.5 BPB Publications
- Foxpro 2.6 for Dummies - Pustak Maha

PROGRAMMING WITH VISUAL BASIC.NET

UNIT 1	Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser. The environment: Editor Tab, format tab, general tab, docking tab. visual development & event drive Programming -Methods and events.
UNIT 2	The VB.NET Language- Variables -Declaring variables, Data Type of variables, Forcing variables declarations, Scope & lifetime of a variable, Constants, Arrays, types of array, control array, Collections, Subroutines, Functions, Passing variable Number of Argument Optional Argument, Returning value from function. Control flow statements: conditional statement, loop statement. MsgBox & Inputbox.
UNIT 3	Working with Forms : Loading, showing and hiding forms, controlling One form within another. GUI Programming with Windows Form: Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, RadioButton, Panel, scroll bar, Timer, ListView, TreeView, toolbar, StatusBar. There Properties, Methods and events. OpenFileDialog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog. Link Label. Designing menus : ContextMenu, access & shorcut keys.
UNIT 4	Object oriented Programming: Classes & objects, fields Properties, Methods & Events, constructor, inheritance. Access Specifiers: Public Private, Protected. Overloading, My Base & My class keywords. Overview of OLE, Accessing the WIN32 API from VB.NET. COM technology, advantages of COM+, COM & .NET, Create User control, register User Control, access com components in .net application.
UNIT 5	Database programming with ADO.NET – Overview of ADO, from ADO to ADO.NET, Accessing Data using Server Explorer. Creating Connection, Command, Data Adapter and Data Set with OLEDB and SQLDB. Display Data on data bound controls, display data on data grid.

TEXT & REFERENCE BOOKS:

- *VB.NET PROGRAMMING BLACK BOOK BY STEVEN HOLZNER –DREAMTECH PUBLICATIONS*
- *MASTERING VB.NET BY EVANGELOS PETROUTSOS- BPB PUBLICATIONS*
- *INTRODUCTION TO .NET FRAMEWORK-WORX PUBLICATION*
- *MSDN.MICROSOFT.COM/NET/*
- *WWW.GOTDOTNET.COM*

INTERNET & E-COMMERCE

UNIT 1	Internet - Evolution, Protocols, Interface Concepts, Internet Vs Intranet, Growth of Internet, ISP, Connectivity - Dial-up, Leased line, VSAT etc., URLs, Domain names, Portals, Application. E-MAIL - Concepts, POP and WEB Based E-mail ,merits, address, Basics of Sending & Receiving, E-mail Protocols, Mailing List, Free Email services. INTERNET protocols - Data Transmission Protocols, Client/Server Architecture & its Characteristics, FTP & its usages. Telnet Concept, Remote Logging, Protocols, Terminal Emulation, Massage Board, Internet chatting - Voice chat, text chat.
UNIT 2	Word wide web (www) - History, Working, Web Browsers, Its functions, Concept of Search Engines, Searching the Web, HTTP, URLs, Web Servers, Web Protocols. Web publishing - Concepts, Domain name Registration, Space on Host Server for Web site, HTML, Design tools, HTML editors , Image editors, Issues in Web site creations & Maintenance, FTP software for upload web site.
UNIT 3	Html - Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and Color controls, Different HTML tags, Table layout and presentation, Use of font size & Attributes, List types and its tags, Use of Frames and Forms in web pages. Introduction to WYSIWYG Design tools for HTML, Overview of MS FrontPage, Macromedia Dream weaver, and other popular HTML
UNIT 4	Javascript Overview, syntax & conventions. Variables, Expressions, Branching & Looping statements, Functions, Arrays Objects, Events & Document Object Model – onClick, onMouseOver, onSubmit, onFocus, onChange, onBlur. onLoad, onUnload. Alerts, Prompts & Confirms.
UNIT 5	E - Commerce An introductions, Concepts, Advantages and disadvantages, Technology in E- Commerce, Internet & E-business, Applications, Feasibility & various constraints. E-transition challenges for Indian corporate. Electronic Payment Systems: Introduction, Types of Electronic Payment Systems, Digital Token-Based Electronic Payment Systems, Smart Cards and Electronic Payment Systems, Credit Card-Based Electronic Payment Systems, Risk and Electronic Payment Systems.

TEXT & REFERENCE BOOKS :

- **Internet and Web Design Made Easier** By A. Mansoor, Pragma Publications, Matura
- **O level Module - M 1.2** - Internet & web page designing by V.K.Jain – BPB Publications.
- **E-Commerce An Indian Perspective (Second Edition)** – by P.T. Joseph, S.J. Presentice-Hall of India
- **Internet for Everyone** - Alexis Leon and Mathews Leon, Vikas Publishing House Pvt. Ltd., New Delhi
- **Internet for Dummies** - Pustak Mahal, new Delhi

- A Beginner's Guide to HTML available at:
<http://www.ncsa.uiuc.edu/General/Internet/WWW/HTMLPrimerAll.html>
- Introduction to Javascript available at –www.mcu.ac.in/Javascriptguide.pdf

SYSTEM ANALYSIS AND DESIGN

UNIT 1	The System Concept, Characteristics, Elements and Types of a system. The System Development Life Cycle, Considerations for candidate systems, Prototyping. The Role of System Analyst
UNIT 2	System planning and Initial Investigation Information Gathering, information gathering tools. Structured Analysis, The Tools of Structured Analysis (DFD, Data Dictionary, Decision tree and Pseudo Codes, Decision Tables), pros and cons of each tool. System performance definition, description of outputs, Feasibility Study Cost/Benefit Analysis: Data Analysis, Cost/Benefit Analysis, The system proposal.
UNIT 3	The Process and Stages of System Design : Design methodologies, development activities. Input design, output design, forms design, types of forms, basics of form design, layout considerations and forms control.
UNIT 4	File structure, file organization, objectives of database, data structure. System Testing and Quality Assurance, Why system testing, what do we test for, the test plan quality assurance, trends in testing, role of data processing auditor. Training and Documentation.
UNIT 5	Implementing and software maintenance, Conversion, combating resistance to change, post implementation review, software maintenance. Hardware/Software Selection and the Computer Contract, suppliers, procedure for hardware/software selection, financial considerations in selection, the computer contract. System Security, Disaster Recovery Planning NOTE :- Various real life case studies and examples in every stages of system analysis and design may be taken.

TEXT & REFERENCE BOOKS:

- **System Analysis and Design**, Elias M. Awad, Galgotia Publications (P) Ltd.
- **System Analysis and Design**, International Ed., Perry Edwards, McGraw Hill Publications.
- **Information Technology & Computer Applications**, by V.K.Kapoor, Sultan Chand & Sons, New Delhi.

Programming with 'C'

UNIT 1	'C' Language Fundamentals Introduction to 'C' Language, Pre Processor, Program Element (Token, Keyword, Data Type, Variable, Delimiter, Identifiers, Constant, Library Function, Conversion Specifies, Operators).
UNIT 2	Program Development in 'C' Program control statement (Sequential Statement, Decision Statement and Looping statement), Array (One Dimensional, Two Dimensional, Multi Dimensional), Array of Character, Sting Manipulation using Library Function, Function (Call by Value, Call by Reference, Recursion), Different Storage Classes.
UNIT 3	User Defined Types and Pointer User Defined Data Types (Structure, Union and Enumeration), Pointers in 'C', Pointer Arithmetic, Pointer Comparison, Pointer to Array, Pointer to Structure, Pointer to Function, Pointer to Pointer, Dynamic Memory Allocation, TypeDef
UNIT 4	Files, Macros and Graphics Macros, Introduction to File, File I/O, Introduction to Graphics

RECOMMENDED BOOKS

1. E. Balaguruswamy "Programming in C", Tata McGraw Hill
2. H. Schildt, "C The Complete Reference", Tata McGraw Hill
3. Y. Kanetkar, "Let us C", BPB Publications

204: Data Structure using C

UNIT 1	Development of Algorithms: Notations & Analysis, storage structures for arrays, Arrays Pointer, Sparse matrices- Structures & Arrays of structures.
UNIT 2	Linked list (Single linked list, doubly linked list, circular linked list), Application of linked list (Polynomial manipulation), Stack & Queue (Implementation of stack as an array and linked list, Application of Stack, prefix, infix, postfix expressions, expression evaluation.
UNIT 3	Binary Trees, Binary search trees, General trees, Tree Traversing, Operations on Binary trees, Expressions manipulations.
UNIT 4	Graphs, Graphs Representation, Path matrix-BFS, DFS- Bi-connected graphs, Shortest path problems.
UNIT 5	Sorting (Selection, Bubble, Insertion, Merge, Quick), Linear Searching, Binary Searching.

Books Suggested

1. Data Structure using C – Rajni Jindal – Umesh Publication
2. Data Structure - Tanenbaum
3. Data Structure using C – B. Baluja Dhanpatrai Publication