Jananayak Chandrashekhar University, Ballia

Department of Computer Science and Application
Course structure and syllabus for
Post Graduate Diploma in computer application
(PGDCA)

First semester		**Marks**
PGDCA-101	Fundamentals of computer and IT	100
PGDCA-102	Programming in 'C' and Data structure	100
PGDCA-103	Operating System	100
PGDCA-104	Database Technology	100
Practical		200
Total		600

Second semester		**Marks**
PGDCA-201	Internet and Introduction to web design	100
PGDCA-202	System analysis and design	100
PGDCA-203	Object oriented programming and Java	100
PGDCA-204	Computer network	100
Practical		200
Total		600

Practical-

In first semester, there should be four lab work based on theory paper. The distribution of marks will be

	Marks
Lab work	160
Viva	40
Total	200

Lab work may include C programming, data structure, operating system (windows) and LINUX.

In second semester, there should be two lab work based on theory paper and a project. The distribution of marks will be

	Marks
Lab work	80
Project	80
Viva	40
Total	200

Lab work may include wave technology and java programming.

PGDCA Syllabus

First semester

Fundamentals of computer and IT
PGDCA-101

UNIT-I

An overview of computer system. Organisation of a Computer System-I/O & CPU. Concept of Data Processing, Generation of Computers, Organisation of Computers, Classification of Computers., Application of Computers.
Components of Computer System- Hardware: Input & Output devices, peripherals printers-impact & non-impact Printers, electromagnetic electrostatic , Inkjet and laser -CRTs-displays -graphics and alphanumeric-keyboards, dumb and intelligent terminals.

UNIT-II

Definition of information, Data Vs Information, Introduction to Information representation in Digital Media, Text, image, graphics, Animation, Audio, Video etc., Need, Value and Quality of information, Category and Level of Information in Business Organization.RAM/ROM, Computer Hardware, CPU, Various I/O devices, Peripherals, Storage Media, Software Definition, Role and Categories, Firmware and Humanwer.

UNIT-III.

Number System and radix- Binary, octal, Decimal, Hexadecimal. Conversion from one system to another. Fractional numbers. One's and two's Complement Representation. Binary Arithmetic: Addition and subtraction , Representation of signed and unsigned binary numbers.
Binary codes- Weighted and non-weighted code. ASCII, EBCDIC, BCD, GRAY and EXCESS-3 codes. Self-complementary codes. Error detection and correction, Parity bit.
Logic circuits-Logic gates NOT, AND, OR, NAND, NOR, XOR, XNOR gates. Universal operation of NAND and NOR gates.

UNIT-IV.

Computer Languages, Generation of Languages, Translators-Interpreters, Compiler/Interpreters, Compilers, Flow, Charts, Dataflow Diagram, Assemblers, Introduction to 4GLs, Software Development Methodology, Life Cycles, Software Coding, Testing, maintenance, ISO.Elementary Concepts in Operating System, textual Vs GUI Interface, Introduction to DOS, MS Windows, MS office Tools, MS WORD, MS EXCEL, MS Power Point, Tools for Data Management, Basics of Database management system, Introduction to basic Commands of Dbase, Foxpro, SQL etc. Scientific, Business, Educational and Entertainment Application, Industry Automation, Weather Forecasting, Awareness of Ongoing IT projects in India NICNET, BRNET etc. Application of IT to other Areas E Commerce, electronic governance, Multimedia, Entertainment.

References:

1. Computer Fundamentals by P.K Sinha (BPB).
2. Computer fundamentals-Architecture and Organisation by B. Ram(Wiley Eastern Limited).
3. D S Yadav, "Foundations of IT", New Age, Delhi
4. Computer Primer by D Rajaraman (Prentice Hall of India).
5. Digital Electronics by Morris Mano.

Programming in 'C' and Data structure
PGDCA-102

UNIT I

Introduction To 'C': Development of C Special features of C language, Structure of a C program, Constants, Literals reserved words, Identifiers, Data types and their sizes, Expression, Statements, Input and output functions, Formatted Input/ Output, Operator and expressions.

Program Structures: Conditional and unconditional branch control structures, Loop Control structures, Break and Continue in Loop structures, C functions, Library functions, User-defined functions, arguments and parameters, Scope rules for identifiers, C structures and union. Declaration and initialization.

UNIT II

Array and Pointers: Array declaration, Multidimensional arrays, String, Rules to initialize arrays, Pointers, declaration of a pointer variable, The address pointers, Pointer arithmatics, Dynamic storage allocation.Files and Graphics in C: File data type, Different file operations, Random access file, Graphics in C, Text mode, Graphics mode, Animation, C processors and command line arguments.

UNIT III

Linear Data Structure: Linear Arrays, Array Storage, Structures, Application of array, Linked Lists, Storage, Structures linked list application, Stacks, Definitions and concepts, Stack aplication polish notations and expression, Queue operation, Queue implementation and applications .

UNIT IV

Non Linear Data Structure: Trees, Basic terminology, Binary Trees, Inorder, Postorder, preorder traversals, Binary Search Trees (BST), Operations on a BST – Insertion, Deletion, Search for a key in BST, Sorting and Searching.

References:

1. C Programming: Schaum Outline Series.
2. Let us C by Y.P.Kanetkar.
3. Introduction of data structures with application by P.G. Sorenson.
4. "Magic with C" AB Publication.

Operating system
PGDCA-103

UNIT-I.

Historical view, Process management and scheduling –state model, process view of OS, job Scheduling, process scheduling, Types of OS- Batch processing, multiprogramming, multitasking, Time sharing & real time system, Function of an OS, structure of OS layered ,kernel based ,microkernel based Structure, Memory management-segmentation , paging and virtual Memory.

UNIT II

File Organization and accessing techniques: Indirect, Line, Sequential , Hashed.

UNIT-III

Introduction , Evolution of Unix OS ,Features & Structure of Unix OS , Difference from Other OS.

Fundamental concepts of Unix System security ,Login, file permissions, home directory, Super user Login/Logout .Unix file system, Special files, Hierarchical file system, use of special files, Introduction to V I Editor. Basic commands of Unix.

UNIT-IV

Introduction to windows

Overview of Windows 98, 10 & Windows XP: GUI, Menu and Menu Bar, Dialogue box, Icons, Control Panel, File system, Managing files and folders, Managing User Accounts, Managing Disks, Managing Desktop, Program Files, Accessories: Word Pad, Note Pad, Paint, etc.

References:

1. Operating systems - Colin Ritchie (BPB).
2. Concepts of operating Systems incorporating UNIX & WINDOWS - D. M. Dhamdhere .
3. Introduction to the X windows system -O. Jones (prentice Hall).
4. A User Guide to the UNIX system - Dr. RebeccaThomas , Jeans Yates (TMH).

Database Technology

PGDCA-104

Unit I

What is database. Traditional file system and Database approach, Advantages of using Databases, types of Databases, concept of data items , fields , records and files, data models, SCHEME AND INSTANCES, DATA INDEPENDENCE DATA BASE LANGUAGES AND INTERFACES E-R Model Concepts, Notations & Examples For E-R Diagrams, Architecture And Concepts Of Relational Databases. .

Unit II.

Introduction and features , SQLplus oracle data types .Table :- creation , insertion , updation , deletion of data contents , modification of Structure , removing deleting , dropping of tables , select of commands , alter table Command . Data constraints:- null value , unique key , primary key , foreign key , logical operator, Range searching , pattern matching , oracle functions.

Unit III

Joins:- joining multiple tables , equi joins , self join, union , intersect and minus clause. Indexes views:- Creation , updation , destroying , selection of data, granting permissions , permissions on The object created by user , grant statement.

Unit IV

Cursors, procedure and function , concepts creation , execution, syntax.
Triggers:-concept , use, how to apply database triggers syntax,setting up
MS Access , designing a database , Add & editing data , tables , queries ,
forms & Reports.

References:

1. Data Base Management : Objectives , System Function & Administration - Everest (TMH)
2. Access 2002 The Complete Reference -Anderson(TMH).
3. How to do Everything with Access 2002 -Anderson(TMH)
4. Bipin Desai, "An introduction to Database system", Galgotia Publications, New Delhi.

Second Semester

Internet and Introduction to Web design
PGDCA-201

UNIT I

Internet Principals: Introduction to Internet, Clients Server Model, Protocol, Internet IP Address, Domain Name, Internet Services, Electronic Mail, World Wide Web, Internet Security, Electronic Commerce (E-Commerce) and Electronic Data Interchange(EDI)

UNIT II

Introduction to HTML: A brief History, HTML Tag, HTML Documents, Header Documents, Body Sections, Heading, Link Document using Anchor Tag, Formatting Characters, Font Tag, Images Characters, Listing, Tables in HTML,**Frames and Forms:** Frames Definitions, Frames, Nested Frames, Elements of a Form

UNIT III

Elements of JavaScript: Data Types, Variables, Operators, Conditional Statements, Array Objects, String Objects,**Server Side Script with JSP:** Clients Responsibilities, Server Responsibilities, Introduction to JSP, JSP Architecture, JSP Servers, JSP Tags, Request Object, Response Objects

UNIT IV

JSP with JDBC: Creating JDBC Data Source Name, Introduction to JDBC, Prepared Statement Class (SQL Statement).

References:

1. The internet complete reference – Hahn, TMH
2. Internet book – Comer, PHI
3. Web Technology & Design B – C. Xavier, New Age International
4. Advance Programming in WEB Design By – V.K. Jain, Cyber Tech. Publication.
5. "Web Technology", Laxmi Publication.

System analysis and design
PGDCA-202

UNIT I

Overview: The system concept, Elements of system ,Types of system , System Development life cycle - Recognition of need –problem identification , Feasibility study, Analysis, Design, Implementation, Post implementation and Maintenance, Consideration for candidate system, , Prototyping, Choice of design methodologies, Fact finding techniques, Auditing trail.The Role of the system Analyst: Introduction, Definition & Historical Perspective, Academic; and Personal Qualifications, The Multifaceted Role of the Analyst: Change Agent, Investigator and Monitor, Architect, Psychologist, Salesperson, Motivator, Politician, The Analyst/User Interface: Behavioral issues, Conflict resolution, The Place of the Analyst in the MIS organization: The MIS organization, Rising Positions in System development, The Paraprofessional.

UNIT II

Feasibility Study: Introduction, System Performance, Definition, Statement of constraints, Identification of specific system objectives, Description of outputs, Feasibility study: Feasibility considerations, steps in Feasibility Analysis, Feasibility Report, Oral Presentation-walk through.

UNIT III

Input/ Output and forms Design: Introduction, Input design-Input data, Input Media & Devices output design: Categories of output, Selection of output media & equipment, Design principle, Output design, documentation and its use, Output packaging, Form design: What is a form? Classification of forms, requirements of form design, Carbon paper as a forms copier, Types of forms, layout consideration, Form control, Procedures.

File organization & data base design: Introduction, File structure, File organization:- Sequential, Indexed, Indexed sequential organization, Inverted list organization, Direct access organization, Data base design objectives of data base key, terms, Logical and physical views of data, Data structure normalization, The role of data base administrator.

UNIT IV

Hardware /Software Selection and The Computer Contract: Introduction, The Computer Industry:- Hardware suppliers, Software suppliers, Service suppliers, The Software industries, types of software, A procedure for Hardware/Software selection:- Major phases in selection, software selection:- The evaluation process, Financial consideration in selection, The rental option, The lease option, The purchase option, The used Computer, The Computer Contract: The art of Negotiation, Contract checklist.

Organizational Adjustment, Testing and Conversion: Introduction, Task identification, Training Orientation, Organization change and resistance, Conversion, Activity network for conversion, System testing, Activity network for system testing, System quality assurance, Software maintenance, Setting maintenance, priorities, Maintenance management, Maintenance guidelines.

References:

1. Systems Analysis and Design by Elias Awad
2.Introducing Systems Analysis and Design by Lee
3..Systems Analysis & Design by Perry Edwards (McGraw Hill)

Object oriented programming and Java
PGDCA-203

Unit I

Abstract data types Introduction , model of real world , attributes , autonomy , generation of correct Application , reusability , classes , instance values , methods and messages , Creating and destroying objects , constraints on object and instance variables , Pre and post conditions methods.

Inheritance:-Inheritance , inheritance with subtyping , redefining instance variables , hiding instance Variables , inheriting methods , overriding , invoking super class methods ,including super class methods – metaclasses , different types of inheritance:- single inheritance , Multiple inheritance , hierarchical inheritance , multilevel inheritance , hybrid inheritance , Defining derived class , visibility modes , protected : to make a private member inheritable.

Unit II

Object Oriented :Concepts and implementation Introduction , polymorphism , object identity , modeling , abstraction , object modeling Technique(OMT) , object modeling concepts , object oriented design , why OOD, object Oriented programming languages , object oriented languages , object oriented database Object oriented user interface.

UNIT III

Overview of Java language

C++ Vs Java , Java and internet , Java and WWW, Java support systems , Java environment , Java program structure , tokens, statements , Java virtual machine , Constants and variables , data types , declaration of variables , scope of variables , Symbolic constants, type casting. Operators:-arithmetic , relational , logical , assignment , increment and decrement ,Conditional , bitwise , special , expression and its evaluation. Decision making and Branching :-If statement , if …else …statement , nesting of if ..else. Statement , else …if ladder , switch ,?operators, Loops, while , do , for , jumps in loops ,Labeled loops.Classes objects and methods

Defining a class , adding variables and methods , creating object , accessing class members , constructions methods , overloading static methods , nesting of methods.

UNIT IV

Arrays: one dimensional & two dimensional arrays , strings , vectors , wrapper classes , defining interfaces, extending interfaces , implementing interfaces , accessing interface variables , system packages , using system packages , naming conventions , creating packages , accessing a package , using package , adding a class to a package ,hiding classes.

Creating Threads, Extending the Thread class , stopping and blocking a Thread , life cycle of Thread , Using Thread method , Thread Exceptions , Thread priority, Synchronization.

Applet programming :

Local and remote applet , applet Vs application , writing applet , applet life cycle , creating an executable applet , designing a web page , applet tag , adding applet to HTML file , running applet , passing parameters(arguments) to applet , getting input from user.

References:

1. Learn Java Now -Davis , R , Stephen(Microsoft Press).
2. Java 2 : The Complete Reference - Herbert Schildt(TMH).
3. JAVA Elements :Principals of programming in Java - Bailey(TMH).
4. Programming with Java- E. Balagurusami (TMH)

Computer networking
PGDCA-204

UNIT I

Introduction to Computer Networks: Definition of Computer networks, Applications of Computer Networks, Kinds of Computer Networks-Local Area Network, Metropolitan Area Network, Wide Area Network, topologies of networks, Layered architecture of networks.

UNIT II

Fundamentals of Data Communication: Types of signals, Types of Transmission, Modes of Transmission, Serial transmission (Asynchronous Transmission, Synchronous Transmission and Isochronous) Parallel transmission, Basic Transmission Categories – Simplex, Half Duplex, Full Duplex.

UNIT III

Fundamentals of Networks: Point to Point Networks, Broadcast Networks, Multicast Networks, Physical Layer Coding Techniques-RZ, NRZ, Differential NRZ, Manchester, Differential Manchester coding, Switching-Circuit Switching, Message Switching, Packet Switching, Confirm and unconfirm services, Framing-Time Based, Character Based, BIT Based, violation of encoding technique & combined approach, Error detection & correction codes – Hamming code , CRC.

UNIT IV

Layered Architectures, TCP/IP model, OSI model. Overview of Physical layer, Data Link Layer, MAC, Network Layer, and Transport Layer functions,LAN Technologies: CSMA/CD or Ethernet & IEEE 802.3 Standard, Token Bus and IEEE 802.4 Standard, Token Ring and IEEE 802.5 Standard.Overview of DNS, FTP, TELNET, HTTP, SMTP and client/server computing.

References:

1. Computer Networks by Tanenbaum (PHI)
2. Computer Communication and Networking by Forozen (PHI)