

KADI SARVA VISHWA VIDYALAYA

Post Graduate Diploma in Computer Applications (PGDCA)

Syllabus

Semester – I

Sr. No.	Subject Code	Name of the Subject	Teaching Scheme	
			Theory	Practical
1.	PGDCA 101	COMPUTER FUNDAMENTALS	√	-
2.	PGDCA 102	FUNDAMENTALS OF PROGRAMMING	√	√
3.	PGDCA 103	MS-OFFICE	√	√
4.	PGDCA 104	WEB TECHNOLOGY	√	√
5.	PGDCA 105	DATABASE MANAGEMENT SYSTEM	√	√
6.	PGDCA 106	DATA STRUCTURES	√	√

Semester – II

Sr. No.	Subject Code	Name of the Subject	Teaching Scheme	
			Theory	Practical
1.	PGDCA 107	OPERATING SYSTEM	√	-
2.	PGDCA 108	NETWORKING TECHNOLOGY	√	-
3.	PGDCA 109	SOFTWARE ENGINEERING	√	-
4.	PGDCA 110	JAVA PROGRAMMING	√	√
5.	PGDCA 111	VISUAL PROGRAMMING	√	√
6.	PGDCA 112	SYSTEM DEVELOPMENT PROJECT	-	√

Name of the Course : Computer Fundamentals
PGDCA Semester I : PGDCA 101, Full Credit

Course Objective

The purpose of this course is to give students an understanding of computer organization: the internal structure and operation of a digital computer at the level of memory, registers and flow of control.

Course Content

Number Systems, Conversions, Boolean algebra, K-map, Combinational and sequential circuit, Arithmetic and logic unit, Memory devices - Buses, interfaces and Control unit, Instruction formats, Addressing modes, RAM, ROM, Introduction to microprocessors, I/O devices: Keyboard, Floppy and Hard Disks, Different types of printers

Text Book

1. Computer Fundamentals (Fourth Edition) – by Rajaraman, PHI

Reference Books

1. Digital Computer Fundamentals – By Thomas Bartee
2. Digital Logic & Computer Design By – Morris Mano
3. IBM PC and Clones By - B. Govindrajalu

Name of the Course : **Fundamentals of Programming**
PGDCA Semester-I : **PGDCA 102, Full Credit**

Course Objective

- Basic concepts of C Programming language
- Basic techniques to solve a problem.
- Implement the solution of problem with the help of C – Programming Language.

Course Content

Introductory Concepts: Introduction to computer, Types of Programming Languages, Flowcharts, Algorithms, Introduction to C,C Fundamentals-C Character Set, Identifiers and Keywords, Data Types, Constant, Variables, Declaration, Expression, Statements, Symbolic Constants. Operators and Expression-Arithmetic, Relational and Logical, Unary, Assignment, Conditional, Increment and Decrement, Bitwise, Special and Library Functions. Data Input and Output-Reading a Character, Writing a Character, Formatted Input, Formatted Output. Decision Making - Data Control Structure (If, if-else, else-if ladder), Loop Control Structure (while, for, do-while, break, continue), Case Control Structure (switch, goto).Functions- What is a Function? , Passing value in a Functions, Scope of a Function, Function Declaration and Prototypes, Call by Value and Call by Reference, Recursion Data Types: Integers-Long and short, Signed and Unsigned, Chars-signed and unsigned, Float and Doubles. Storage Classes: Automatic, Register, Static, External Arrays-Introduction, One-Dimensional Arrays, Two- Dimensional Arrays, Initializing Two- Dimensional Arrays, Multidimensional Array String – What are Strings?, Declaring and Initializing string variables, Reading from the terminal and Writing to the screen, Operations on String, String Handling Functions. Structures and Union- Structure Initialization, Comparison of Structure Variables, Array of Structure, Array within Structures, Structures within Structures, Structure and Function, Union. Pointers-Fundamentals, Pointer Declaration, Passing Pointer to Function, Pointer and One Dimensional Array, Dynamic memory allocation, Operations on Pointers, Pointers and Multidimensional Arrays, Passing Function to Other Function. File Handling.

Text Book

1. Let Us C by Yaswant Kanetkar, BPB Publication

Reference Books

1. Programming in C by Pradip Dey and Manas Ghosh, Oxford University Press
2. Programming with C by Byron Gottfried, Schaums Outline, Tata McGraw Hill
3. Programming in ANSI C by E.Balagurusamy, Tata McGraw Hill

Name of the Course : **MS-OFFICE**
PGDCA Semester-I : **PGDCA 103, Full Credit**

Course Objective

- Basic concepts of MS-Office
- Working with DOS Operating System
- To learn office documentation work

Course Content

What is OS? – Application of OS, Booting - Warm – Cold booting, History of DOS, DOS: Internal – External commands (dir,copy con, type, md, cd, rd, delete, copy, prompt, date, time, chkdisk, xcopy, scandisk, prn, format, etc) Limitation of DOS

Advantages of Windows - Difference: DOS – Windows, Comparison of Windows difference versions (Win 98, 2000 ,NT, Xp, Vista etc), Windows different terms (Desktop, Icon, Wallpaper, Taskbar, My computer, Network Neighborhood, My document, Recycle bin, Control panel & it's setting, Find, Shutdown, Logoff, Typing Tutor, Notepad, Paint, etc What is MS Word ? - Applications of MS Word, Basic operation (New, open, save, save as, pages setup, print, print preview, undo, redo, find, replace, goto, diff. Views, Header-footer, etc), Formatting operation (Bold, Italic, Font, paragraph, bullets-numbering, Border shading, Change case, column, text direction, drawing toolbar Etc)

What is MS Excel ? - Applications of MS Excel (workbook, worksheet, & workspace), Spreadsheet's Interface & Entering data in Excel, Absolute , Relative , Mix cell address & Range, Editing & Formatting worksheet, Dates , Formulas & Functions (Numeric, Text , Statistical , Date , Logical , Financial & Database), Productivity with excel by (macro , table , goal seek , charts , pivot table & chart), Analyzing data with excel by countif , sumif , whatif , vlookup, hlookup, etc

What is MS Powerpoint ? – Applications of Presentation, Interface of Powerpoint, Creating presentation (add slide , formatting , resizing frames, adding colors , background & shading), Special Features (custom animation , slide transition , slide sorter, insert sound & videos, etc)

What is MS Outlook ? – Advantages of outlook express, Interface of Outlook, Creating account for outlook (POP server setup), Feature of Address book / Contacts

Text Book

1. PC Software for Windows By R. K. Taxali

Reference Books

1. Microsoft Windows 2000
2. Microsoft Windows Bible

Name of the Course : **Web Technology**
PGDCA Semester-I : **PGDCA 104, Full Credit**

Course Objective

The primary objective is to impart knowledge about Internet and there applications. This course also teaches the students to develop static web page using HTML and to develop a project using HTML

Course Content

What is Internet – How Information Travels across – How TCP/IP works – Understanding Internet address and Domains- How the Domain name system works? – How the Routers work - Connecting to the Internet: connecting your computer to Internet – How the Network Computers work – How DSL works

Communicating on the Internet: Working of E-mails – Email spam and Blocking – Internet chat and Instant messaging – Making phone calls on the Internet

Common Internet Tools: Gophers – Telnet – FTP and Downloading Files – Web browsers – Markup language – web host servers – websites work with databases – Audio/Video on the Internet – Working of the Intranet – Firewalls – Cookies – Cryptography and Privacy – Digital certification .

HTML: Requirements for using HTML – Building the foundation – providing structures – Adding context – Using basic style – creating lists – Adding links – adding images to a web page – creating the image map – animation graphics. Creating tables for data-using tables for page layout – creating frames – using frames for page layout – creating a navigation bar – creating HTML forms – Basics of scripting language – adding layers. Dynamically changing style – Dynamically changing page content – Using CGI – Using meta information to describe the document – creating widely accessible web pages – validating the HTML – Publishing the web pages.

Text Book

1. How the Internet Works – Preston Gralia ,tech media , fourth edition
2. Practical HTML - Lee Anne Phillips, Prentice Hall of India

Reference Books

1. The Internet in a Nutshell – Valerie Quercia, Shroff Publishers & Distributors

Name of the Course : **Database Management System**
PGDCA Semester-I : **PGDCA 105, Full Credit**

Course Objective

The course envisages introducing to the students the basic operations of the database and exposing them to the use of access as an important tool and the concepts like data analysis and what-if analysis. Fundamentals of Database, Queries, Reports and Macros using MS Access also form an important constituent of the course objectives.

Course Content

Database Concepts –

File System and Databases – Historical roots of database, database systems and models.

Relational Database Model – Logical view of data, integrity rules, relational database operators, data redundancy, index.

Design and Implementation Concepts –

E-R Modeling – Basic modeling concepts, data models: degree of data abstraction, E-R model (with example)

Normalization of Database Tables – Database tables and normalization, Database design (with examples), higher level normal forms, de-normalization.

Structured Query Language(SQL) – Introduction to SQL, Data definition commands, data manipulation commands, queries, advanced data management commands, complex queries, updatable views, converting E-R model into Database structure (with example), rules governing relationship among tables.

Advanced Database Concepts –

Transaction Management and Concurrency control – What is transaction, properties, transaction log, concurrency control with – (locking methods, time stamping methods and optimistic methods), database recovery

Distributed Database Management Systems – Advantages, disadvantages, distributed database and distributed processing, DDBMS components.

Text Book

1. Database Systems – Design, Implementation and Management, 4th edition - Rob & Coronal, Thomson Publication

Reference Books

1. Database Management System: Vipin Desai, Galgotia publication
2. Database Management System: Korth, TMH publication
3. Understanding SQL: Martin Grubber, BPB publication
4. SQL a Complete Reference: Alex Leon, Mathews Leon, TMH publication

Name of the Course : Data Structures
PGDCA Semester II : PGDCA 106, Full Credit

Course Objective

The purpose of this course is to provide the students with solid foundations in the basic concepts of programming: data structures and algorithms.

Course Content

The Use of Data - Logical Data Structures – Primitive and Simple structures – Linear and Non Linear structures - Basic Terminology – Storing strings – character data types - Linear arrays – Representation of linear arrays in memory – Traversing linear arrays – Representation of records in memory - Linear List – Stack - Stack operations – Applications of Stack – Queue – Queue operations - Hashing – Open Hashing – Closed Hashing – Rehashing –Resolving Collisions - Internal sorting - Insertion sort – selection sort – Shell sort – Bubble sort – Merge sort – Quick sort.

Trees: Tree operations, Traversals – Preorder, Inorder, Postorder; Binary tree, Tree terminologies, Binary Search Tree, BST operations, AVL tree, Splay tree;

Graphs: Graph structure, terminologies, operations, Traversals – DFS, BFS; Kruskals algorithm, Prims algorithm

Text Book

1. Classic Data Structures By D. Samanta, Tata McGraw Hill.

Reference Book

1. An Introduction to Data Structures with Applications – Jean Paul Tremblay, Paul G Sorenson
2. Data and File Structures By Mark Allen Weiss
3. Data structures using C by Yashwant Kanitkar
4. Data structures using C and C++ by Tanenbaum

Name of the Course : Operating System
PGDCA Semester II : PGDCA 107, Full Credit

Course Objective

This subject provides a basic introduction to computer operating systems. The operating system provides the necessary facilities to allow the application programs to access the computer.

Course Content

What is an Operating System? Operating System Concepts, Its features - Memory Management, Process Management, Thread Management, I/O Management.

Memory Management: Background, Logical versus Physical Address space, swapping, Contiguous allocation, Paging, Segmentation

Virtual Memory: Demand Paging, Page Replacement, Page-replacement Algorithms,

Processes: Process Concept, Process Scheduling - CPU Scheduling: Basic Concepts, Process Synchronization: Background, The Critical-Section Problem, Synchronization Hardware, Semaphores - Deadlocks - Security and Protection

Threads: State Model, need of threads, advantages, monitors

Text Books

1. "Operating System Concepts", William Stallings, Pearson, 5th Ed

Reference Books

1. Tannenbaum, "Operating Systems", PHI, 4th Edition, 2000
2. Madnick E., Donovan J., "Operating Systems", Tata PGDCA 1Graw Hill, 2001
3. Operating System by Milan Milankovic

Name of the Course : **Networking Technologies**
PGDCA Semester - II : **PGDCA 108, Full Credit**

Course Objective

To introduce the concept of electronic data transmission, the representation of data in a transmission system and the design of communication methods in a distributed computer system.

To discuss the possible network configurations and control strategies necessary for various applications. Protocols, architectures and transmission alternatives, communication environment, regulatory issues, network pricing and management.

Course Content

Fundamentals of Data Transmission, Communications Systems and Data Communication, Basics of Network, History of Networks, Network Topology; LAN, MAN, WAN, Rules, Models, Layers and 7-layer OSI Model, The Communication Channel; Electromagnetic Waves; The Electromagnetic Spectrum; Bandwidth and Channel Capacity;

Error Detection and Correction, Communication Protocols - The Nature of Errors; Parity; Cyclic Redundancy Codes; Dealing with Errors, Data Link Layer Protocols;

MAC layer and Network layer - ALOHA, CSMA\CD, WDMA, MACA and MACAW Protocols;

Transport layer and Application Layer - TPDU, Three Way Handshake, Two-Army Problem, DNS, Name Servers, Resolvers, E-mail, SMTP, MIME, POP3;

Network Security - Security Features, Cryptography, RSA.

Text Book

1. Computer Networks by Andrew S. Tanenbaum – 4th Edition.

Reference Book

1. Data Communications and Networking by Behrouz Forouzan – 2nd Edition

Name of the Course : **Software Engineering**
PGDCA Semester-I : **PGDCA 109, Full Credit**

Course Objective

The course envisages introducing to the students the conventional methods for software engineering including analysis, design and testing strategies and exposing them to the project management concepts. Risk analysis, software configuration management and software quality assurance also form an important constituent of the course objectives.

Course Content

Introduction to software engineering - A Generic view of process: A Layered Technology, Process framework, Capability Maturity Model Integration, Process Assessment, Personal and Team process models, Process technology, Product and Process- Process Models.

Requirement Engineering: A Bridge to Design and Construction, Requirement engineering tasks, Initiating, Eliciting, Negotiating, Validating Requirements Building Analysis Model, Design Engineering, Design Model.

Creating An Architectural Design: Software Architecture, Data Design, Architectural Styles and Patterns, Architectural Design – Representing system in context, Assessing Alternative Architectural Design, Mapping Data Flow into a Software Architecture Interface Design: Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design steps – Design Steps and Issues

Testing Strategies: Strategic approach for Software Testing, Strategic Issues, For Conventional Software, Validation, System testing, Art of Debugging

Testing Tactics: Testing Fundamentals, Black Box Testing, White Box Testing, Basis Path Testing, Control Structure Testing, Testing for specialized Environment.

TEXT BOOKS

1. Roger .S. Pressman "Software Engineering: A Practitioners Approach", 5e, TMH.

REFERENCES

1. Sommerville, "Software Engineering", 6e, PEA
2. Pfleeger, "Software Engineering: Theory and Practice", PEA.
3. Peter Pedrycz, "Software Engineering: An Engineering Approach", John Wiely.
4. Ghezzi, Jazayere, "Fundamentals of Software Engineering", 2e, PHI.

Name of the Course : **Visual Programming**
PGDCA Semester-II : **PGDCA 110, Full Credit**

Course Objective

The purpose of this course is to give students an understanding of Client/Server architecture with their application tools. The course also teaches the students about the steps in System Development Life Cycle.

Course Content

Client-Server Architecture

Distributed processing; Cooperative processing; Client/Server processing; Peer-to-peer processing; Client/Server architecture; Time sharing; Resource sharing; How do the client and server communicate ?; Differences between a database server and a file server; Database server architecture; open systems interconnect (ISO) model; Application Architecture : Information system architecture; Function (application) architecture; Data architecture; Network(technology)architecture; application partitioning models.

Client/Server Application System Development Life Cycle (SDLC)

A mission critical application; Functional specification; Business rules; Database design; Data distribution; Prototyping; User interface design; Front-end module design; Reusable modules; Goals of the design stage; Where is user interface (UI) design in the SDLC ?; The usability iceberg Process for doing UI design, Requirement gathering; Multiple prototypes

Client-Server Applications Tools

Visual Basic : Objects, properties, methods, and events; Form, control, and application; Properties and methods of a form; an Object Browser, and basic controls; Changing properties and calling methods with code; adding code to event procedures; Control accessibility; Interacting with the user; Working with code statements; Variables and Procedures : Variables; Constants; Converting data types; procedures; Debugging; Types of errors; Debugging toolbar; Break mode; Debug window; Controlling Program Execution; Conditional statements; Looping statement; Working with Controls : Additional standard controls; Custom controls; Menus; Status Bars and Toolbars; Creating a menu; Pop-up menus; Data Access with Data Control : Overview of a database (table, field record key); Data control overview; Viewing records; Data Form Designer; Entering and editing records; Drag and Drop Editing; Steps for adding drag and drop functionality

Text Book

1. Special Edition Using Visual Basic 6 - Silver, Spotts, PHI SPECIAL EDITION

Reference Books

1. Visual Basic 6 Programming : Black Book – Steven Holzner
2. Guide to Client Server by Joe Salemi (BPB-94)

Name of the Course : **Java Programming**
PGDCA Semester-II : **PGDCA 111, Full Credit**

Course Objective

To develop familiarity with the Java Language, to induce the concepts of object oriented methodology, to implement object oriented analysis and design.

Course Content

Java Concepts - What is JAVA, its Characteristics, JVM, JRE, Concepts – Polymorphism, Abstraction etc. The Java Workshop; Java Classes; a Java Object; a Java Class; Putting Classes and Objects to Work; Deriving a New Class; the new Operator; Java Constructors, Threading and Applet Threading, creating a thread, working with thread; The Applet; Using Panels and other tools in Applets. File Handling File Features, File Opening, File Closing, Appending in a File, Copying contents of one file to another;

Socket Programming: Creating Sockets, Client and server communication, connecting multiple clients and multiple servers. GUI Programming (AWT) Creating a Window, Dealing with Frames and its objects, Declaring a Button Object; Handling Java Events; Check Boxes; Radio Buttons; Panels; Scroll-bars; The Frame Class; Menus; Dialog Boxes

Text Books

1. Teach Yourself Java

REFERENCES

1. Java 2 By E. Balagurusamy
2. Complete Reference Java 2

Name of the Course : **System Development Project**
PGDCA Semester-II : **PGDCA 112, Full Credit**

Course Objective

The purpose of this course is to give students corporate exposure. It will also provide a platform for students so that they can implement their theoretical concepts.

Course Content

Student has to submit the Synopsis for the project they will be doing in a company or organization. After his / her Synopsis is approved by the internal guide, he / she will follow the project guidelines and will have to complete the project in the scheduled time. He/she has to remain present in internal presentations.

At the time of final presentation, a project document will have to be submitted and the student will have to give a presentation of what he/she has done in the project.

Project carries a total of 100 marks consisting of following scheme – 80% for the project evaluation and 20% for viva-voce. The project has to be submitted as hardcopy along with a soft copy. Viva-voce will be conducted by experts nominated by the institute. Good Quality white executive bond paper A4 size should be used.

Care should be taken to avoid smudging while duplicating the copies.