DEPARTMENT OF COMPUTER SCIENCE

A.P.S. UNIVERSITY, REWA, M.P.

Syllabus For

POST GRADUATE DIPLOMA IN COMPUTER SCIENCE & APPLICATION

(PGDCA)

(One year, Two Semester Fulltime Course)

2008-09 Onwards

Department of Computer Science
A.P.S. University, Rewa (M.P.)

Syllabus for Post Graduate Diploma in Computer Science & Application PGDCA

(One Year, Two Semester Course)

Session 2008-2009 Onwards

BASIC GOALS & OBJECTIES

- To prepare very high quality IT/Computer professionals for a global market by grooming them in IT/Computer and software development skills

- To provide an opportunity not only to IT/Computer professionals but also to professionals and experts from non-IT domains to acquire a thorough knowledge of IT concepts and the capacity to swiftly translate this knowledge into services in their respective domains

- To develop students sensitivity and capability to continually respond to changing technology and working environments, by using an 'active learning' approach

- To enable students to accept opportunities in a framework of professionally sound and quality conscious organizations, as well as to take up entrepreneurial ventures.

- To enable research in Computer & IT related field by creating experimental laboratories & exploring frontiers areas in the IT field

Department of Computer Science

A.P.S. University, Rewa (M.P.)

Syllabus for Post Graduate Diploma in Computer Science & Application PGDCA

(One Year, Two Semester Course)

CURRICULUM AT A GLANCE

CLASS / SEMESTER	P.G.D.C.A.	CCE 30 %	Min. MARKS	TERM END EXAM70%	MIN. MARKS	TOTAL 100%	MIN. MARKS
FIRST SEMESTER	Paper –101 Computer Fundamentals	30	10	70	24	100	34
	Paper –102 Programming in C	30	10	70	24	100	34
	Paper-103 Office Automation S/W Tools	30	10	70	24	100	34
	Paper –104 Analysis & Design of Information System	30	10	70	24	100	34
	Paper –105 S/W Lab – I Prog. In C	30	10	70	24	100	34
	Paper- 106 S/W Lab – II O/S & Office Automation	30	10	70	24	100	34
	Paper-107 Application Project Part-I	-	-	-	-	100*	
				Total First Sem		700	
SECOND SEMESTER	Paper –201 Java Programming	30	10	70	24	100	34
	Paper –202 DBMS	30	10	70	24	100	34
	Paper –203(A) *OPTIONAL* Computer Networks Or Paper –203(B) *OPTIONAL* Computer Oriented Accounting & Financial Applications Or Paper –203(C) *OPTIONAL* Computer Oriented Numerical & Statistical Techniques	30	10	70	24	100	34
	Paper-204 S/W Lab I – Java Programming & HTML	30	10	70	24	100	34
	Paper-205 S/W Lab II – Foxpro & Oracle	30	10	70	24	100	34
	Paper-206 Application Project Part-II	-	-	-	-	200*	
				Total Second Sem		700	
				GRAND TOTAL		1400	

***50% FOR REPORTING, 30% FOR PRESENTATION & 20% FOR VIVA**

*CCE : CONTINUOUS COMPREHENSIVE EVALUATION.

INDIVIDUAL PASSING REQUIRED FOR THEORY AND PRACTICAL SUBJECT.

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R. K. Katare

Department of Computer Science
A.P.S. University, Rewa (M.P.)

PGDCA FIRST SEMESTER

Paper code PGDCA 101
COMPUTER FUNDAMENTALS

Time: 3 hours **Max.Marks. 70**
Min.Marks. 24

UNIT–I

Introduction to computers : Evolution, characteristics & capabilities; classification: Analog, Hybrid, Digital; Micro, Mini, Main and Super; Components of computer system; Block Diagram, Input devices, Output devices, CPU, only preliminary concept of Software, Hardware, Low Level Language, High Level Language, Compiler and Interpreter, Preliminary idea of Multimedia computers and associated basic components.

UNIT–II

Number system : Introduction to decimal, binary, octal, hexadecimal number systems and their interconversion; Coding: (ASCII, EBCDIC, BCD), Introduction to primary memories (RAM, ROM, PROM and EPROM), Preliminary concept of Extended, Expanded and Virtual Memory, Registers, Counters, Storage devices: Hard disks, Floppy disks (sector, cylinder, track, seek time, latency time and response time).

UNIT–III

Introduction to Operating Systems : Definition, function, evolution: (Only preliminary idea of terms: Batch processing, multiprogramming, multiprocessing, multitasking, time sharing, on-line processing, real time, and some popular operating systems for PC's); Introduction to DOS; Internal commands, external commands (Tree, Diskcopy, Undelete, Chkdsk, Fdisk, Backup, Restore, Format, Unformat, Attrib, Xcopy, Diskcomp); Concept of wild cards, batch files, config files, filtering, piping and redirection.

UNIT–IV

UNIX : Structure of UNIX system, Kernel, UNIX file system : Concept of files and directories; File oriented commands like cat, cp, grep, pwd, chmod, mv, rm, pg, passwd, bc; File permissions, Directory oriented commands like ls, mkdir, cd, rmdir, inter-user communication commands like write, mail, mesg,, General utilities commands like echo, cut, passwd, kill, date, wc, sleep, who, ps; Introduction to vi editor.

UNIT–V

Windows : Introduction, windows desktop, start button, taskbar, switching between programs and windows, managing files, folders and objects, windows explorer, creating shortcuts, control panel; windows accessories :– paintbrush, wordpad, customizing windows, sharing information among applications, network neighbourhood, sharing folders and printers, Internet explorer.

Books Recommended:

1. Jain Satish: Introduction to Computer Science, BPB
2. Sinha, P.K.: Computer Fundamental, BPB
3. Thomas R: Dos 6 and 6.2 Instant reference, BPB
4. Koparker, P. K.: UNIX for you, TMH
5. MS Windows 95/98 – Techmedia publication
6. Alan Simpson's: Easy Guide to Windows, BPB

Note: In all there will be **TEN** questions. **Two questions are to be asked from each of the five units (with internal choice in each unit).** The students are expected to attempt only one question from each unit

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PGDCA FIRST SEMESTER

Paper code PGDCA 102
PROGRAMMING IN C

Time: 3 hours

Max.Marks. 70
Min.Marks 24

UNIT–I

C language programming: Principles of good programming (flowchart, algorithm). Introduction to C language: The structure of a simple program: Simple I/O functions (scanf, printf, gets, puts, getchar, getche, getch); Use of semicolon, braces, parentheses, comments and newline character; Data types in C. Assignment statement, Arithmetic, Relational & Logical operators; Conditional operators, Precedence of operators

UNIT–II

Control structure: The if-else statements, nesting of if-else, switch statement. Loops: while and do-while loop, the for loop. Functions: User defined functions, Returning a value from a function, Local and Global variables, Storage classes, Parameters, Type declaration of a function, Functions with more than one parameters, Prototype of a function.

UNIT–III

Arrays: Declaration and initialization; the break and continue statement; String and Character arrays, operations with arrays: searching in array (linear and binary). Sorting an array (Bubble, Selection and Insertion). String & String functions: sprintf, strcpy, scanf, strcat, strlen, malloc, sizeof, strcmp..

UNIT–IV

Pointers: The concept of pointers, passing pointers as parameters, arrays of pointers, Pointer to pointers, Array of pointers to strings, Sorting an array, using pointers, Structures: The concept of structure, Initializing, Arrays of structures, Arrays within structures, Structures within Structures, passing structures to function, unions, basic graphics functions in Turbo C.

UNIT–V

Files: Files in 'C', Modes for files; Functions used in files (getc, putc, fopen, fclose, fscanf, fread, fwrite, fprintf, fseek, ftell, rewind), text versus binary files, The C preprocessor, Preliminaries of C preprocessor Directives, (#define, #undef, #include, #ifdef, #ifndef, #endif, #else, #if), Bitwise operators.

Books Recommended:

1. Gottfried, Programming with C, TMH
2. Rajaraman, Introduction to C, PHI
3. Cooper, Mullish, The Spirit of C, An introduction to modern programming, Jaico Pub. House, N. Delhi.
4. Y. Kanetkar, Understanding Pointer in C, BPB
5. Y. Kanetkar, Let us C, BPB
6. Y. Kanetkar, Exploring in C, BPB

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PGDCA FIRST SEMESTER

Paper code PGDCA 103
OFFICE AUTOMATION – S/W TOOLS

Max.Marks. 70
Min.Marks. 24

Time: 3 hours

UNIT–I

Introduction to Microsoft Office : The Office Manager. Sharing Information with Microsoft Office. The Clipboard. Object Linking and Embedding (OLE). Editing Linked Information. Editing Embedded Objects. Word Processing with Word for Windows: Word Basics: Undo. Redo. Repeat. Inserting Text. Replacing Text. Formatting Text. Cut. Copying from one Word Document to Another. Print. Autoformat.

UNIT–II

MS WORD : Working with Headers. Footers. Endnotes. Footnotes. tabs. tables. sorting. Working with graphics: Importing graphics, Sizing and Cropping graphics with the picture command. Drawing objects. Text in Drawings (Word Art). Pictures using Drawing objects. Rotating and Flipping Objects. Callouts. Filling: Templates. Wizards: Spelling Checker. Autocorrect. Autotext. Grammar Checker. Word Count and Other Statistics. Creating Tables of Contents and Index. Macros. Introduction to Mail Merge.

UNIT–III

MS EXCEL: Overview of Excel Features. Rearranging worksheets: Excel page setup. changing column widths and row heights. autoformat. manual formatting. using different styles. hiding rows and columns. working with multiple worksheets. An Introduction to excel functions. Excels chart features: Instant charts with the chart Wizard. creating charts on separate Worksheets. Resizing and Moving charts. adding chart notes and arrows. editing charts. Working with graphics in excel: creating and placing graphic objects. resizing graphics. Introduction to Excel's command Macros. using worksheets as databases.

UNIT–IV

MS POWERPOINT: Creating presentations. Auto content wizard. editing slides. Working with Text in Power Point. Formatting and Aligning Text: Working with graphics in Power Point: Importing images from the outside and drawing in power point. creating organizational charts. inserting cliparts & picture/photos in Power Point Presentation. Excel charts in power point. inserting table from word. Arranging. Previewing and rehearsing. transition and building effects. printing presentation elements. creating overhead transparencies.

UNIT–V

MS ACCESS : Creation of databases. tables. forms. reports & queries. use of macros & modules. creation of relationships among tables, generating simple queries using databases. MS-Access with other applications and Internet. sharing data between applications. Administering & securing a database. Writing expressions for queries.

Books Recommended :

1. Mansfield R.: The Compact guide to MS-OFFICE. BPB
2 Murray : Mastering POWER POINT 6.0 for Windows. BPB
3. Cowart : ABC's of MS – ACCESS. BPB.

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R. K. Patare

Department of Computer Science
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PGDCA FIRST SEMESTER

Paper code PGDCA 104
Analysis and Design of Information System

Time: 3 hours **Max.Marks. 70**
Min.Marks.24

UNIT-I

Organizational Foundation of IS: Historical Evolution of Information system. The competitive Business Environment. Advantages of Using Computerized Information System (IS). Six major types of Information System. The changing matter of Information Technology. Challenges of Information systems. Relationship between Organisation and Information systems. Salient Features of Organization and management. Classical Model. Behavioral Model and Decision Model. Levels and types of Decision Making. System Approach Theory. Management Challenges. Ethical and Social Impact of Information System.

UNIT –II

Technical Foundation of Information System: Charting Techniques. Structured Analysis and Design. Decision Tree. Decision Table. DFD. Data Dictionary. Information System Software Tools and Approaches: Advantages and disadvantages of using IS Software Tools. Idea of Object Oriented Programming. CASE tool. PERT & CPM. Recent Database Management Trends. Distributed Databases: Object Oriented and Hypermedia Databases. Telecommunications. The Internet.

UNIT –III

Building Information System: Traditional System Development Life Cycle (SDLC). Analysis: Problem Identification. Fact Gathering. Fact Analysis. Feasibility Study. Feasibility Report. Design: Physical and Logical Design. File Design. I/O Design. Database Design. Limitation of traditional life cycle approach. Prototyping. Outsourcing information system. A Typical Case Study of Information System.

UNIT –IV

Implementation: Managing and Controlling of Information System. Testing. training. conversion. Post Implementation phase. Ensuring quality with IS. Traditional tool & methodology for quality assurance. New approaches to quality assurance. Measuring Information System Success. Areas of Problem in Information System. Causes of Information system Success and Failure. Controlling Risk Factor. Auditing Information System.

UNIT–V

Management and Organizational Support Systems: Knowledge Work System. Decision Support System (DSS). Group Decision Support System (GDSS). Executive Support System (ESS). Artificial Intelligence (AI). Expert System. Neural Network. Growth of International Information System. Main Technological Issues: Merger of International Technology and Infrastructure.

Books Recommended:

1. Lauden C. Kennieth & Lauden P. Jane: Management Information System: Organization Technique. PHI.
2. Awad E. M.: Systems Analysis and Design. Galgotia Pub.
3. Murdic. Ross. Clagett : Information Systems for Modern Management. PHI
4. Bhatnagar S. C. : Computer & Information Management. PHI

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Shrivastava R.K. Tatare

Department of Computer Science
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PGDCA SECOND SEMESTER

Paper code PGDCA 201
Java Programming

Max.Marks. 70
Min.Marks. 24

Time: 3 hours

UNIT I

Introduction to Object Oriented Programming: Basic concepts, benefits of OOPS, Application of OOP, Java evolution : history, features, C, C++ & Java a comparison. Java and WWW, HW, & SW requirements for Java, Structure of simple Java program, Java tokens, statements, Java virtual machine, command line arguments, programming style, constants & variables, symbolic constants, type casting: Various operators in Java (arithmetic, relational, logical , assignment, increment, decrement, conditional, bitwise & special operator); arithmetic expressions & their evaluation, precedence of arithmetic operators, type conversations in expressions, operator precedence and associativity, mathematical functions.

UNIT II

Decision making and branching: Decision making with if statement, simple if statement, the if....else statement, nesting of if.....else statements, the else if Ladder, the switch statement, The ? operators, the while statement, the do statement, the do statement, the for statement, jump in loops, labeled loops, classes, objects and methods; Defining a class, objects and methods: Defining a class, adding variables and methods, creating objects, accessing class members, constructors, method overloading, static members, nesting of methods inheritance; extending a class, overriding methods, final variables and methods, final classes, finalize methods, abstract methods and classes visibility control.

UNIT III

Arrays, strings and vectors; Arrays, one dimensional arrays, creating an array, two dimensional arrays, strings, vectors, wrapper classes, defining interfaces, multiple inheritance, extending interfaces, implementing interfaces, accessing interface variable, Packages: Java API packages, using system packages, naming conventions, creating packages, accessing a package, using a package, adding a class to a package, hiding classes.

UNIT IV

Multithreaded programming; creating threads, extending the thread class, stopping and blocking a thread, life cycle of a thread, using thread methods, thread exceptions, thread priority, synchronization, implementing the runnable interface elements algorithms, thrashing, other consideration, demand segmentation.

UNIT V

Applet programming; Local and remote applets, how applets differ from applications, preparing to write applets, building applets code, applet life cycle, creating and executable applet, designing a web page, adding applet to HTML file, running the applet, more about applet tag, passing parameters to applets, aligning the display, more about HTML tags, displaying numerical values, getting input from the user.

Book Recommended:

1. Programming with Java a primer by E. Balagurusamy.
2. Peter Norton's Guide to Java Programming, Techmedia Pub.
3. Mastering in Java, Techmedia Pub.schatz & Galvin
4. Core JAVA 2 Volume_I Fundamentals Sun Microsystems

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PGDCA SECOND SEMESTER

Paper code PGDCA 202
DATA BASE MANAGEMENT SYSTEM

Time: 3 hours **Max.Marks. 70**
Min.Marks. 24

UNIT I

Basic Concept:
An Introduction to database System, Database System Architecture, Purpose of DBMS, Data Independency, Basic File Systems, File Organization: Sequential, Index Sequential, Hosting, B-Tree based index, Sequential File Organisation, Detailed design of E-R Data Model. *Security & Integrity*: Introduction, Access Control, Crypto Systems, Statistical Database Security; Concurrency Control: Transaction & Locking, Database: Kinds of Failure, Recovery Techniques.

UNIT II

Three Data Models:
An Overview of three Main Data Models i.e. Hierarchical Model, Network Model, Relational Model and their Intercomparision, Concept of Relation, Relational Algebra: Basic Operation like Union, Intersection, Difference, Product Join. The Power of SQL (Creation, Insertion, Deletion, Indexing & Modification of Databases in SQL).

UNIT III

Normalisation: Relational Database Design: Integrity Constraints, Functional Dependency: Single Value and Multi Value Functional dependence, Normal Forms: I, II, III, Boyce Codd, & IVth Normal forms, Join dependency.

UNIT IV

Introduction to Database and foxpro package:
Ideas of database hierarchy (bit, byte, field, record): Foxpro commands: create, use, list, display, edit, browse, append, insert, delete, zap, pack, copy, to print, quit, clear, go top, go bottom, modify structure, recall, replace, sort, index, locate, continue, seek, search, find, close. Arithmetic, date, time and string function with database using commands/functions such as count, aveage, sum, time, day, dow, cdow, year, date, ctod, dtoc, cmonth, month, val, trim, str), displaying information with ? and ??.

UNIT V

Programming: Using Input, Output statements and Conditional statement ACCEPT, INPUT, IF-ELSE-ENDIF, DO CASE-ENDCASE, DO WHILE-ENDDO, TEXT-ENDTEXT, SKIP, WAIT, STORE, SET commands, Generation of Report, Label and Customized Screen, Use of multiple files: Master file updation, Setting relations.

Books recommended:

1. Henry F. Korth & A. Silbershatz: Data Base System Concepts, MGH
2. C. J. Date: Database Management System, MGH
3. R. K. Taxali: Foxpro 2.6, TMH.
4. Arun K. Majumdar & P. Bhattacharya: Data Base Management System, TMH
5. Jeffrey O. Ullman : Principles of Database Systems, Galgotia Pub. Co. Ltd.
6. Bipin C. Desai: An Introduction to Database Systems, Galgotia Pub. Co. Ltd.
7 James Martin: Principles of Database Management, PHI
8. James Martin, Computer Database organization, PHI

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PGDCA FIRST SEMESTER

Paper code PGDCA 203(A)
COMPUTER NETWORKS

Max.Marks. 70
Min.Marks. 24

Time: 3 hours

UNIT I

Introduction to Computer Networks:
Basics of data communication, digital vs analog transmission, mode of transmission. Computer Networks: Goals and kinds (LAN/WAN), idea of hardware and software requirements for computer networks, intercomparison of various communication media, wireless transmission., various topologies: bus, ring, tree & mesh. OSI reference model vs TCP/IP.

UNIT II

Data Link Layer:
Reference models: OSI vs TCP/IP, Data Link Layer Design Issues: Framing Error Control and Flow Control, Error Detection & Correction, Elementary Data Link Protocols, Sliding Windows Protocols, HDLC frame packet.

UNIT III

Medium Access Sub Layer:
Medium Access Sublayer: Channel allocation problem, Multiple access protocols: ALOHA, CSMA, Collision tree; Standards in LAN/WAN (CCITT & IEEE), High speed LANs: FDDI, Fast Ethernet; Satellite Networks: Polling, FDM, TDM, CDMA.

UNIT IV

The Network and Transport Layer:
Network Layer design issues, routing and switching techniques, Routing Algorithms, congestion control algorithms, the network layer in the internet; transport layer: Elements of transport services, transport protocols, the internet transport protocol, TCP & UDP.

UNIT V

Application Layers and Network Management:
Network Security: Traditional cryptography, cryptography principles, secret key algorithms, public key algorithm, Authentication protocol, Domain Name System, Simple Network Management Protocol, E-mail, News group, WWW, Future trends in computer networks.

Books recommended

1 Tanenbaum: Computer Networks, PHI
2 John Freer: Computer Communication & Networks, EWP
3 William Stalling: Data & Computer Communication, PHI
4. Basandra & Jaiswal: Local Area Network, Galgotia
5. James Martin: Computer Networks & Distributed processing , PHI
6. Uyless Black: Computer Networks, PHI

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PGDCA SECOND SEMESTER

Paper code PGDCA 203(B)
COMPUTER ORIENTED ACCOUNTING & FINANCIAL APPLICATIONS

Time: 3 hours **Max.Marks. 70**
Min.Marks. 24

UNIT–I

Accounting: Basic concept, conventions and principles. Double entry system. Introduction to basic books of accounts, Journal, Ledger. Closing of books of accounts. Trial balance: Final Accounts. Trading, profit and loss accounts and balance sheet.

UNIT–II

Introduction to Financial Management: Meaning and scope; Ratio analysis: Meaning, advantages, Limitations.

UNIT–III

Fund flow statement: Meaning, Importance, Preparation and Interpretation. Cash flow statement: Meaning, Importance, Preparation and Interpretation.

UNIT–IV

Introduction to Costing: Nature, Importance Principles and Types. Budget and budgetary control: Nature, Importance, Type (Master budget and flexible budget) and Preparation

UNIT–V

Introduction to Computerized accounting System: Coding logic codes required, master files, transaction files, introduction to documents used for data collection, processing of different files and outputs obtained. General idea of accounting packages.

Books Recommended:

1. Shukla & Greval, Advance Accounts, S. Chand & Co.
2. Sharma & Gupta, Financial Management, Kalyani
3. Sharma & Gupta, Management Accounting, Kalyani.

R. K. Katare

Department of Computer Science
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PGDCA SECOND SEMESTER

Paper code PGDCA 203(C)
COMPUTER ORIENTED NUMERICAL & STATISTICAL TECHNIQUES

Max.Marks. 70
Time: 3 hours **Min.Marks. 24**

UNIT–I

Computer arithmetic: Floating point numbers – operations, normalization's and their consequences; Iterative methods; Zero of a single transcendental equations and zeros of polynomials using bisection, false position, Newton – Raphson. Convergence of solution.

UNIT–II

Simultaneous linear equations: Solutions of simultaneous linear equations – gauss elimination method and pivoting; ILL-conditional equations and refinement of solutions; Gauss-seidal iterative method.

UNIT–III

Numerical differentiation and Integration, solutions of differential equation: Runga-Kutta methods; Predictor corrector methods; automatic error monitoring; stability of solution.

UNIT–IV

Interpolation and approximation: Polynomial interpolation-Newton and Lagrange; Difference tables, Different frequency charts.

UNIT–V

Regression Analysis: Least square fit: Polynomial and curve fittings; Linear regression and non-linear regression algorithms, multiple regression algorithms, General idea of statistical packages.

Books Recommended:

1. Krishnamurthy, E. V. Sen, S. K.; Computer Based Numerical Algorithms, East West Press.
2. Motewar, S. N.; A course in computer programming with numerical techniques, Dhanpat Rai and sons, Delhi.
3. Rajaraman V.; Computer Oriented Numerical Mathematics, PHI.

R. K. Kalare