

**BHUPAL NOBLES' UNIVERSITY,
UDAIPUR**

FACULTY OF SCIENCE

**DEPARTMENT OF
COMPUTER SCIENCE**

&

APPLICATION

POST GRADUATE DIPLOMA IN COMPUTER APPLICATION

(PGDCA)

Semester 1

Course	Paper Name	No. of Credits	Max. Marks		Total
			Ext.	Int.	
PGDCA 111	Computers Fundamentals	4	70	30	100
PGDCA 112	Problem Solving Using C Language	4	70	30	100
PGDCA 113	Office Automation Tools	4	70	30	100
PGDCA 114	Web Application Development	4	70	30	100
PGDCA 115	Practical-I: Programming in C Lab	2	70	30	100
PGDCA 116	Practical-II: Office Automation Tools Lab	2	70	30	100
PGDCA 117	Practical-III: Web Application Development Lab	2	70	30	100

Semester 2

Course	Paper Name	No. of Credits	Max. Marks		Total
			Ext.	Int.	
PGDCA 121	Database Management Systems	4	70	30	100
PGDCA 122	Object Oriented Programming with C++	4	70	30	100
PGDCA 123	Desktop Publishing	4	70	30	100
PGDCA 124	Hardware & Networking	4	70	30	100
PGDCA 125	Practical-I: Database Management Systems Lab	2	70	30	100
PGDCA 126	Practical-II: Object Oriented Programming in C++ Lab	2	70	30	100
PGDCA 127	Practical-III:	2	70	30	100

	Desktop Publishing Lab				
PGDCA 128	Practical-IV: Project	6	70	30	100

PGDCA

Semester I

PGDCA 111: Computer Fundamentals

UNIT-I

Introduction: Evolution of computers, Capabilities and limitations of computers, Generations of computers, micro, mini, main frame, supercomputers, Block diagram of computer, Basic components of a computer system

UNIT-II

Input unit, output unit, Arithmetic logic Unit, Control unit, central processing unit, Instruction set, registers, processor speed, type of processors.

Memory: Main memory organization, main memory capacity, RAM, ROM, EPROM, PROM, cache memory, PCs specifications.

UNIT-III

Secondary Storage Devices: Magnetic Tape, Magnetic Disks, Internal Hard Disk, External Hard Drives, Floppy Disks, Optical Disks- CD,VCD, CD-R, CD-RW, DVD, Solid State Storage0Flash Memory, USB Drives.

UNIT-IV

Input devices: Keyboard, Pointing Devices mouse, Touch Screens, Joystick, Electronic pen, Trackball, Scanning Devices- Optical Scanners, OCR, OMR, Bar Code Readers, MICR, Digitizer, Electronic card reader, Image Capturing Devices- Digital Cameras. Output devices- Monitors CRT, LCD/TFT, Printers- Dot matrix, Inkjet, Laser, Plotters- Drum, Flatbed, Screen image projector

UNIT-V

Computer Software: 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 operation system for PCs-DOS, windows, linux.

Recommended Books:

1. Pradeep K. Sinha, Priti Sinha, "Computer Fundamentals". BPB Publications.
2. Rajaraman, V., "Fundamental of Computers". Prentice Hall India, New Delhi

PGDCA 112: Problem Solving Using C Language

UNIT-I

Algorithm and algorithm development: Definition and properties of algorithm, flow chart symbols, conversion of flow chart to language, example of simple algorithms, Introduction to program design, errors – syntax error, runtime error, logic error.

UNIT-II

Introductory Concepts: Types of programming languages, Introduction to C, some simple C programs, Desirable program characteristics. C Fundamentals: C character Set, Identifiers and keywords, data types, constants, variables and arrays, Declarations, expressions, statements, Symbolic constants.

UNIT-III

Operators and expressions: Arithmetic operators, unary operator, Relational and logical operators, assignment operators, conditional operators, Library Functions.

Data Input and Output: Preliminaries, single character input, single character output, Entering input data, writing output data, the gets() and puts() function.

UNIT-IV

Control Statements: if else statement for, do, while, statements Nested control statements, switch statement, break statement, The continue statement, Arrays: Defining an array, processing an array, Multidimensional arrays, Arrays and strings.

UNIT-V

Functions: A brief overview, Defining a function, accessing a function, function prototypes, passing arguments to a function, recursion ,structure, union

Pointers: Fundamentals, Pointer declarations, Passing pointers to the functions, pointers and one dimensional array

Recommended Books:

1. Byron Gottfried, “Programming with C”, Schaum’s Outlines, Tata McGraw Hill.
2. Mullis Cooper, “Spirit of C”: Jacob Publications.
3. YashwantKanetkar, “Let us C”: BPB.
4. Kerninghan B.W. & Ritchie D. M., “The C ProgrammingLanguage”: PHI.

PGDCA 113: Office Automation Tools

UNIT-I

Windows: Definition, Benefits, Features & uses of Windows, Control panel, Accessories, Task bar, My computer uses, Recycle bin.

UNIT-II

Common Office: Elements, Introduction to Office, Customizing the Office Environment, Managing Files in Office, Text Tools, Drawing and Graphics Tools.

Word Processing: Definition, Benefits, Features & uses of Word Menus, Toolbars, Cursor control keys, Short cut keys, Hot keys, Editing Text, Document Formatting, Reusable formatting with Styles and Templates, File handling (opening, creating, saving, printing, editing), Formatting text, Find and replace, Tables and Columns, Mail Merge, Labels

UNIT-III

Spreadsheets: Definition, Benefits, Features & Uses of MS Excel Menus, Toolbars, Worksheets, Formatting Worksheets and Restricting Data, Calculating with Formulas and Functions, Ranges, Auto fill, Data (sort, filter, validation, subtotal), Viewing and Manipulating Data with charts and PivotTables, Print, Goal seek, Scenario, Macros,

UNIT-IV

Presentations: Definition, Benefits, Features & Uses of PowerPoint, Menus, Toolbars, Creating and Editing Slides, Adding graphics, Multimedia, and Special Effects to Slides, Insert (picture, slide, text), Master slide, Views, Animation, Action buttons, Macros.

UNIT-V

DOS commands: Internal (DIR, DATE, TIME, CLS, CD, RD, MD, PATH, TYPE, DEL, ECHO, COPY, REN, PROMPT, VOL, VER), external (ATTRIB, CHKDSK, DISKCOPY, DISKCOMP, XCOPY, TREE, DELTREE, DOSKEY, FORMAT, FIND, SORT, FDISK, MORE, SYS), Concept of files & directories.

Recommended Books:

1. Jennifer Ackerman Kettell, Guy Hart0Davis, Curt Simmons, "Microsoft Office 2003: The Complete Reference", Tata McGraw Hill.
2. Biswaroop Roy Choudhary, "Computer course", Fusion Books.

PGDCA 114: Web Application Development

UNIT-I

Introduction to WWW: Protocols and programs, secure connections, application and development tools, the web browser

Web Design: Web site design principles, planning the site and navigation

Introduction to HTML: The development process, basic HTML, formatting and fonts, commenting code, color, hyperlink, lists, tables, images, simple HTML forms, web site structure.

UNIT-II

Introduction to XHTML : XML, Move to XHTML, Meta tags, Character entities, frames and frame sets, inside browser

Style sheets : Need for CSS, introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS, CSS2

UNIT-III

Javascript: Client side scripting, What is Javascript, How to develop Javascript, simple Javascript, variables, functions, conditions, loops and repetition Javascript : Advance script, Javascript and objects, Javascript own objects, the DOM and web browser environments, forms and validations

UNIT IV

DHTML: Combining HTML, CSS and Javascript, events and buttons, controlling your browser
XML : Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, Well formed, using XML with application.XML, XSL and XSLT. Introduction to XSL, XML transformed simple example, XSL elements, transforming with XSLT

UNIT V

Web services, Feeds and Blogs: Need for web services, SOAP, SOAP XML and HTTP, Web feeds, Blogs, The server side : What is server, choices, setting up UNIX and Linux web servers, Logging users, dynamic IP

Recommended Books:

1. Developing Web Application, Ralph Moseley, Wiley India
2. Web Design, Joel Sklar, Cengage Learning

PRACTICALS

PGDCA 115: Programming in C Lab

1. Addition and subtraction of 8 bit numbers
2. Find 1's and 2's complement of 8 and 16 bit numbers
3. Shifting left/right of 8/16 bit numbers
4. Logical operation such as - masking and setting of specific bits
5. To find larger/smaller of two numbers
6. Sum of series of 8 bit numbers
7. To arrange a series of numbers in ascending/descending order
8. To multiply, divide two 8 bit numbers
9. Multi byte addition, subtraction
10. Matrix addition, subtraction, multiplication
11. WAP to print the sum and product of digits of an integer.
12. WAP to reverse a number.
13. WAP to compute the sum of the first n terms of the following series $S = 1 + 1/2 + 1/3 + 1/4 + \dots$
14. WAP to compute the sum of the first n terms of the following series $S = 1 - 2 + 3 - 4 + 5 - \dots$
15. Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.
16. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.

PGDCA116: Practical based on PGDCA 113

PGDCA117: Practical based on PGDCA 114

Semester II

PGDCA121: Database Management Systems

UNIT-I

Introduction:

Characteristics of database approach, data models, database system architecture and data independence, data definition language, data manipulation language, data base administrator, data base users.

UNIT-II

Entity Relationship(ER) Modeling:

Entity types, relationships, constraints, keys, E-R diagram, reduction E-R diagrams to tables, generation, aggregation, design of an E-R database scheme.

UNIT-III

Relation data model:

Relational model concepts, relational constraints, relational algebra, SQL queries

UNIT-IV

Database design:

Mapping ER/EER model to relational database, functional dependencies, Lossless decomposition, Normalforms(upto BCNF).

Transaction Processing:

ACID properties, concurrency control

UNIT-V

File Structure and Indexing:

Operations on files, File of Unordered and ordered records, overview of File organizations, Indexing structures for files(Primary index, secondary index, clustering index), Multilevel indexing using B and B+ trees.

Recommended Books:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, Pearson Education, 2010.
2. R. Ramakrishanan, J. Gehrke, Database Management Systems 3rd Edition, McGraw-Hill, 2002.
3. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition, McGraw Hill, 2010.
4. R. Elmasri, S.B. Navathe Database Systems Models, Languages, Design and application Programming, 6th Edition, Pearson Education,2013

PGDCA122: Object Oriented Programming with C++

UNIT-I

Different paradigms for problem solving, need for OOP, differences between OOP and procedure oriented programming, abstraction, overview of OOP principles- encapsulation, inheritance and data binding polymorphism. abstraction.

UNIT-II

C++ basics: Structure of a C++ program, data types, declaration of variables, expressions, operators, type conversions, pointers and arrays, strings, structures, references, flow control statement, functions-scope of variables, parameter passing, recursive functions, default arguments, inline functions, dynamic memory allocation and deallocation operators.

UNIT-III

C++ classes and data abstraction: Class definition, class structure, class objects, class scope, this pointer, static class members, constant member functions, constructors and destructors, dynamic creation and destruction of objects, friend function and class, static class member.

Overloading: Function overloading, operator overloading – unary, binary operators.

UNIT-IV

Inheritance: Defining a class hierarchy, different forms of inheritance, defining the base and derived classes, access to the base class members, base and derived class construction, destructors, virtual base class.

UNIT-V

Polymorphism: Static and dynamic bindings, base and derived class virtual functions, dynamic binding through virtual functions, virtual function call mechanism, pure virtual functions, abstract classes.

Recommended Books:

1. Richard Johnson, An Introduction to Object-Oriented Application Development, Thomson Learning, 2006
2. B. Stroustrup, The C++ Programming Language, Addison Wesley, 2004.

PGDCA123: Desktop Publishing

UNIT I

Desk Top Publishing: Introduction, Merits and Demerits, Windows accessories, Word Processing through MS Word.

UNIT II

Adobe Page Maker : Basic concept: Creating and opening publication, using the tool box, working with palettes, text and graphics, starting a publication from the template, saving and closing a publication moving of text block and graphics, placing text file, setting tab, indents, and leaders copying graphics between publication, positioning and resizing the logo.

UNIT III

Adobe Photoshop

Image Fundamentals: -Digital image pixel. Resolution. DPI, raster image/bitmaps. Vector Image/graphics. Various File Format:- Bitmap, JPEG, PSD, PDD, TIFF, GIF, WMF.
Understanding Various Tools:- Marquee-Rectangular/Elliptical. Move Lasso, Polygonal I Lasso Magnetic Lasso, Magic wand. Crop Air brush, Paint brush, Pencil, Rubber Stamp, Pattern stamp, Erase, Paint bucket, Direct selection, Path component selection , Pen custom shape, eye dropper, Hand Zoom.

UNIT IV

Corel Draw:

Introduction: Creating Opening drawing. Setting up the drawing page. Using the rulers. Grid and guidelines. Viewing document. Drawing and Shaping Objects:- Drawing. Moving & Shaping Object, drawing lines and curves, dimensions line. Working with Style & Templates. Organizing Objects:- Arranging & Changing the order of objects. Grouping, Ungrouping locking and unlocking objects. Working with multiple on screen color palettes. Adding graphics symbols and specials character Editing Formatting text & paragraph.

UNIT V

Adobe In Design

Document and column set up for a variety of publications Identification of tools Use of rulers, guides and snap-to guides Page formatting type including styles, sizes, leading, tracking, kerning. Using the edit menu –cutting, copying, pasting Multiple pasting, editing stories, spell checking. Formatting paragraphs, moving/resizing text blocks, leading adjustment etc. Placing graphics, resizing graphics, text wraps Setting up templates and style palettes Grouping and aligning objects. Rotation tool, drop caps, page numbering and insertion of special symbols.

Suggested Books:

1. M.C. Sharma, "Desktop Publishing".

PGDCA124: Hardware & Networking

UNIT-I

CPU Cabinet and Laptop:

Basic understanding of working of different kind of semiconducting components used in Mother Board, H.D.D. and memories, significance and difference in RAM and ROM

Prime Power Devices:

Usage and circuits of SMPS and adapter, Ports application and uses –LAN card, USB port, HDMI port and VGA cable

UNIT-II

Display System of computer:

Types of analog and digital display display system – CRT,TFT, LCD, their construction working principle, pixel density and picture resolution of monitor screen. Setting of screen-contrast, brightness, colour quality wallpaper, advantage of timeout and screen saver. Screen camera-pixel size and resolution

UNIT-III

Input and Output devices:

Printer:

Brief introduction of printer's working, setting of printing papers, loading and refilling of cartridge, expected trouble and their remedies. Types of Printer-Dot matrix, Laser jet, Scan jet, and Colour printer

Keyboard:

Maintenance and functions of all keys and buttons for fast processing

Scanner:

Uses and setting for better scanning, solution to troubles in different scanners

UNIT-IV

Assembling and Installation of computers:

Identification of quality and compatibility of mother board, RAM, ROM, H.D.D., cables for assembling of computer system, types of connectors – pin male-female, care in pushing and detaching connectors, Layout of components in CPU and LAPTOP

UNIT-V

LAN card, WirelessLAN card, SCSI card, Web camera, CCTV camera, Mobile devices, Firewire cards, Modem, Wireless LAN access point, Routers, Switch, Video conferencing.

Reference Book:

1. Computer Architecture & Maintenance, John L. HENNESSY, David A. Patterson Ed. 3-2012, Morgan Kaufmann
2. Digital Electronics in Computer Application, A.K. Maini Ed. I-2007, John Willey & sons ltd.

PRACTICALS

PGDCA 125: Database Management Systems Lab

EMPLOYEE Schema

Field	Type	NULL	KEY	DEFAULT
Empno	Char(3)	NO	PRI	NIL
Ename	Varchar(50)	NO		NIL
Job_type	Varchar(50)	NO		NIL
Manager	Char(3)	Yes	FK	NIL
Hire_date	Date	NO		NIL
Dno	Integer	YES	FK	NIL
Commission	Decimal(10,2)	YES		NIL
Salary	Decimal(7,2)	NO		NIL

DEPARTMENT Schema

Field	Type	NULL	KEY	DEFAULT
Dno	Integer	No	PRI	NULL
Dname	Varchar(50)	Yes		NULL
Location	Varchar(50)	Yes		New Delhi

Query List

1. Query to display Employee Name, Job, Hire Date, Employee Number; for each employee with the Employee Number appearing first.
2. Query to display unique Jobs from the Employee Table.
3. Query to display the Employee Name concatenated by a Job separated by a comma.
4. Query to display all the data from the Employee Table. Separate each Column by a comma and name the said column as THE_OUTPUT.
5. Query to display the Employee Name and Salary of all the employees earning more than \$2850.
6. Query to display Employee Name and Department Number for the Employee No= 7900.
7. Query to display Employee Name and Salary for all employees whose salary is not in the range of \$1500 and \$2850.
8. Query to display Employee Name and Department No. of all the employees in Dept 10 and Dept 30 in the alphabetical order by name.
9. Query to display Name and Hire Date of every Employee who was hired in 1981
10. Query to display Name and Job of all employees who don't have a current Manager.
11. Query to display the Name, Salary and Commission for all the employees who earn commission.
12. Sort the data in descending order of Salary and Commission.
13. Query to display Name of all the employees where the third letter of their name is _A'.
14. Query to display Name of all employees either have two _R's or have two _A's in their name and are either in Dept No = 30 or their Manger's Employee No = 7788.
15. Query to display Name, Salary and Commission for all employees whose Commission Amount is 14 greater than their Salary increased by 5%.
16. Query to display the Current Date.
17. Query to display Name, Hire Date and Salary Review Date which is the 1st Monday after six months of employment.
18. Query to display Name and calculate the number of months between today and the date each employee was hired.

19. Query to display the following for each employee <E-Name> earns < Salary> monthly but wants < 3 * Current Salary >. Label the Column as Dream Salary

PGDCA126: Object Oriented Programming in C++ Lab

1. WAP to print the sum and product of digits of an integer.
2. WAP to reverse a number.
3. WAP to compute the sum of the first n terms of the following series $S = 1 + 1/2 + 1/3 + 1/4 + \dots$.
4. WAP to compute the sum of the first n terms of the following series $S = 1 - 2 + 3 - 4 + 5 - \dots$.
5. Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.
6. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.
7. WAP to compute the factors of a given number.
8. Write a macro that swaps two numbers. WAP to use it.
9. WAP to print a triangle of stars as follows (take number of lines from user):

```
*
***
*****
*****
```
10. WAP to perform following actions on an array entered by the user:
 - i. Print the even-valued elements
 - ii. Print the odd-valued elements
 - iii. Calculate and print the sum and average of the elements of array
 - iv. Print the maximum and minimum element of array
 - v. Remove the duplicates from the array
 - vi. Print the array in reverse order
11. Write a program that swaps two numbers using pointers.
12. Write a program in which a function is passed address of two variables and then alter its contents.
13. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
14. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
15. WAP to display Fibonacci series (i) using recursion, (ii) using iteration
16. WAP to calculate Factorial of a number (i) using recursion, (ii) using iteration
17. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion.
18. Create Matrix class using templates. Write a menu-driven program to perform following Matrix operations (2-D array implementation):
 - i. Sum
 - ii. Difference
 - iii. Product
 - iv. Transpose
19. Create a class Triangle. Include overloaded functions for calculating area. Overload assignment operator and equality operator.
20. Create a class Box containing length, breath and height. Include following methods in it:
 - i. Calculate Volume

- ii. Calculate surface Area
 - iii. Increment, Overload ++ operator (both prefix & postfix)
 - iv. Decrement, Overload -- operator (both prefix & postfix)
 - v. Overload operator == (to check equality of two boxes), as a friend function
 - vi. Overload Assignment operator
 - vii. Check if it is a Cube or cuboid
21. Write a program which takes input from the user for length, breath and height to test the above class.
22. Write a program that will read 10 integers from user and store them in an array. Implement array using pointers. The program will print the array elements in ascending and descending order.

PGDCA127: Desktop Publishing Lab
Practical Based on PGDCA 123

PGDCA 128: Project

