

**Syllabus**  
**&**  
**Ordinances**  
**of**

*Advanced Post Graduate Diploma in  
Computer Applications  
( Ad. PGDCA)*

**Regulations 2020**

**Faculty of Education & Allied Sciences  
M.J.P. Rohilkhand University, Bareilly**

**Ad.PGDCA (Advanced Post Graduate Diploma in Computer Application)**  
Proposed w.e.f. July 2022

**General Objectives of the Course**

- 1.The Broad objectives of the course Ad.PGDCA is to prepare graduate students for productive careers in software industry.
- 2.To Develop dynamic computer professional and covers all aspects and basics in computer applications.
- 3.To Emphasizes the application of software technology to solve networking, communication and commercial problems.
- 4.Keeping in view the rapid growth of IT and liberalization of the economy, the Advanced PGDCA is especially designed to enable the students to build career in emerging world of computer and IT.
- 5.After completion of this course students can make career in computer programming, network administration, computer engineering, web development and technical support etc.

The course design of Ad.PGDCA is given below-

**Semester-I**

<b>Course Code</b>	<b>Subject/Paper</b>	<b>Credit</b>	<b>External Exam Marks</b>	<b>Internal Exam Marks</b>	<b>Total Marks</b>
AD-101	Computer Fundamentals & IT	5	70	30	100
AD-102	Operating Systems- Windows & Unix	5	70	30	100
AD-103	Programming through 'C'	5	70	30	100
AD-104	Data Base Technology	5	70	30	100
ADP-105	Practical	4	70	30	100
	<b>Total Credits</b>	<b>24</b>			

**Semester-II**

<b>Course Code</b>	<b>Subject/Paper</b>	<b>Credit</b>	<b>External Exam Marks</b>	<b>Internal Exam Marks</b>	<b>Total Marks</b>
AD-201	Visual Basic	5	70	30	100
AD-202	Object Oriented Analysis & Design through Java	5	70	30	100
AD-203	Overviews of Internet & Web Designing	5	70	30	100
ADP-204	Practical	4	70	30	100
ADP-205	Industrial Training & Project Viva	8	70	30	100
AD-206	New Media	5	70	30	100
	<b>Total Credits</b>	<b>32</b>			

## Semester-I

AD-101

### Paper-I (Computer Fundamentals & IT)

**Objective :** The objective of this paper is to provide the basic knowledge of computers with hardware and software concepts, Boolean algebra, logic circuits and knowledge of operating system and detailed knowledge of Windows operating system Windows and Unix operating system .

#### Unit-I

##### **Fundamentals of Computer :**

Historical evolution of computers, Generations of computers, Classification of computers – based on size, processor, Usefulness of Computers. Applications of computers, Block Diagram along its components and characteristics, Interaction between the CPU, Memory Input/output devices, function of CPU and major functional parts of CPU. State the relevance of speed and word length for CPU Performance, Recognize the current family of CPUs used in Computers,

#### Unit-II

**Types of Memory** and input/output devices : RAM ROM, Monitor, Mouse, Keyboard, Disk, joysticks, Storage Devices, floppy disk, CD, DVD, Pen drive, trackballs, Printers Types of printers, Scanner, Modem, Video, Sound cards, Speakers

#### Unit-III

##### **Data Representation**

Definition of Information, difference between data and information ,importance of Binary Number System, various number systems and their conversion of one system to others , Binary addition , subtraction, multiplication, division. 1<sup>s</sup> and 2<sup>s</sup> compliments,Memory Addressing and its Importance, Binary Code : weighted and un weighted code ASCII, EBCDIC, BCD, GRAY and EXCESS-3 codes, self complementary codes, Error detection & correction, Parity bit.

#### Unit-IV

**Boolean Algebra** : Representation of values and complements, Boolean operator NOT, AND OR, postulates of Booleans algebra, De morgan's theorem, Boolean expression, truth table, sum of product forms and product of sum forms, Minterms & Maxterms simplification of Boolean expression – using postulates, two, three, four variables K-maps, Octates, Quards and Paires.

#### Unit-V

**Information Technology(IT)**, ICT, need and features of IT,MS-WORD, MS-EXCEL, MS-Power Point, application of IT to other areas E-Commerce, features of e-commerce,electronic governance, Multimedia, Entertainment.

#### **Suggested Readings**

- 1 Computer Fundamental – Architecture and Organization By B.Ram (Wiley Eastern Limited )
- 2 Fundamentals of Computers By V.Rajaraman (PHI)
- 3 Computer Fundamentals By R.K. Sinha (BPB)
- 4 Computer Primer By D. Rajaramman (PHI)

**AD-102**

**PAPER II- (Operating Systems-Windows & Unix)**

**OBJECTIVES**

The objectives of this paper is to acquaint the students with the knowledge of operating system and detailed knowledge of WINDOWS and operating system UNIX.

**Unit-I**

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

**Unit-II**

Introduction to graphical user Interface(GUI). Windows 9x as an operating system , Hardware Considerations. Software compatibility Upgrading from windows 8.1 Working with dialog boxes , Text boxes, check boxes sliding controls Menus and icon, pulldown menus , dialog boxes Mouse support , double click, working with taskbar ,Introduction to desktop, Folders, Control Panel, working with recycle bin , Briefcase , Programs wizards using mouse and key board , Existing Windows.

**Unit-III**

Help, find running applications working with explorer using run renaming a file or a folder ,Deleting a file or folder creating a new folder drag and drop copying and moving files , Installing programs wallpapers screen saver and fonts , Multimedia support. DOS application Installing, configuring and tuning. Adding new Hard ware-plug and play ,Accessories-Wordpad,Systemtools.paint,Calculator,ClipboardViewer,Notepad,CharacterMap. Multitasking and task Switching. Object linking and Embedding.

**Unit-IV**

**Unix Operating System**

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

Fundamental concept 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 vi Editor.

**Unit-V**

**Basic files and directors commands:** pwd, mkdir,ls ,cd , cat, rm ,rmdir, chmod, chgrp, umask, cp, pr, uname, logname, id, who, tty echo, ps, kill news , date, passwd, clear, dircmp, cmp,diff, diffb, comm, file, head, tail, find, pg, split, dd ,touch, tee, sort, crypt, sum, pack, unpack, pcat, du, df, cpio, tar, env wc, sleep, at, wait, mail, cal, banner, write, mesg.

**References:**

1. Operating Systems-Colin Ritchie (BPB)
2. Concepts of Operating Systems incorporating UNIX & WINDOWS-D.M. Dhamdhare.
3. DOS The Complete Reference 4<sup>th</sup> ed.-K. James(Osborne)
4. Inside Windows 95-A.King (Microsoft Press)

**AD-103**

**PAPER III (PROGRAMMING THROUGH 'C' )**

**Objectives:**

The course is designed to help you master the essential disciplines in programming in C including advanced programming techniques, dynamic data structure in C and file handling through C.

**Unit-I**

Introduction to computer based problem solving requirements of problem solving by the computer :

- Problem definition
- Use of example for problem solving
- Problem solving strategies

\* Program design and implementation issues: Program and Algorithms, Top down design and stepwise refinement, Breaking a problem into sub task, Data organization and data structure, Construction of loops basics programming construct, Establishing initial condition, Termination conditions, Implementation, Use of procedures for module design, Choice of variable name, Documentation of programs, Program design.

**UNIT-II FUNDAMENTALS OF 'C' PROGRAMMING**

Overviews of 'C', History of 'C', Structure of 'C' program

\* Data typing : int , float , char, double, void.

\* constants and variables

- Integer, float, real, character, logical variables.
- String variables

\* operators and Expression: Arithmetic, Relational, Logical, Expression

\* control constructs : if then, for, Do while, switch break , continue, exit() function, goto and label.

\* Arrays Declarations: One and two dimensional array

\* Functions fundamental: General form functional arguments, return value

\* Basic I/O – formatted I/O – unformatted I/O

\* Advanced features

- Type modifiers and storage class specifies for data types
- Bit wise operator ? operator, “operator
- Type casting and type conversion

**UNIT-III: ADVANCED PROGRAMMING TECHNIQUES**

\* Scope Rules: Local and global variables, Scope rules of function.

\* Function : Call by value call by reference, Calling functions with array, Argc and argv

**UNIT-IV DYNAMIC DATA STRUCTURE IN 'C'**

**Pointers:** -& and \* operator, pointer expression, assignment, arithmetic comparison , dynamic Allocation function Calloc and Malloc .

-Pointers vs array array of pointers, pointer initializing pointers pointer to function , function

Returning pointers , function , with variable of number of arguments.

**Structure**

Basic of structure , declaring a structure, referencing structure elements , array of structure, passing structure to function , passing entire structure to function , structure pointer, declaring a structure Pointer , using structure pointer , array and structure within structure and its use.

**Union**

-Declaration , enumerated data typing , type def examples, Algorithm , link list insertion, Deletion, search

**UNIT-V : MISCELLANEOUS FEATURES**

**File handling**

File pointer , file accessing function, fopen, fclose, putc, getc and fprintf etc.

'C' standard Library function and header files.

Header files –stdio.h , ctype.h , string.h, math.h , stdarg.h, time.h etc.

Standard library functions, String functions , mathematical functions, data and time functions , variable Argument list function , utility function, character class test function.

### **Suggested Readings**

1. W. Kernighan and Dm Ritche, the 'c' programming language (PHL)
2. Working with 'C'-Yashwant KanetKar(BPB)
3. How to solve it by computer-R.G.Droney(PHL) Schaum series-(PHL)
4. Understanding Pointer by 'C'-Yashwant KanetKar(PHL)

**AD-104**

**PAPER IV (DATABASE TECHNOLOGY )**

**OBJECTIVES**

The course is designed to understand about Relational Database to manage the data at back end for different applications. They should be able to develop basic table and write query to fetch the required data.

**UNIT-I**

Database System Concept & Data Modeling: Basic concepts, Advantages of a DBMS over file processing system, Data Abstraction, Database Languages, Data Independence. , Components of a DBMS and overall structure of a DBMS. ,Three views of Data (External View, Conceptual View, Internal View), Three level architecture of DBMS, Data Independence, , Client Server Architecture, DBA .

**UNIT-II**

**Data Models**

Define data model, Data Models : Network Model Hierarchical Model, E-R Model, Advantage & Disadvantages of each Data Model

**ER Model** : Entity sets and relationship sets- Attributes - Keys in entity and relationship sets - Mapping constraints, Participation Constraint, E-R diagram, Notations. Strong Entity Set and Weak Entity Set.

**UNIT-III**

**MYSQL/SQL**

Data definition language(DDL), Data manipulation language(DML), SQL, Data types, Tables (Creating , Inserting, Updating and deleting tables and using constraints), Views, Indexes, : (a) Super Key (b) Candidate Key (c) Primary Key (e) Unique Key.

**SQL Commands** :- Describe, select, where clause, distinct clause, order by, having, logical operations, sql operators, join, alter, granting permission,

**UNIT-IV**

Relational Database Design, Relational Scheme and Relational Design, Anomalies in a Database: A Consequence of Bad Design, Universal Relation, Functional Dependency, Relational Database Design. Database Security, Integrity, and Control, Security and Integrity, Threats, Defense Mechanisms, Integrity

**UNIT-V**

**MS-ACCESS** : Setting up MS Access , designing a database, Add & editing data , table , queries, forms & Reports.

**Text Books:**

1. Desai, B., "An Introduction To Database Concepts." Galgotia Publications, New Delhi.
2. Access 2002 The Complete Reference -Anderson(TMh).

**Reference Books:**

1. Date C.J., "An Introduction to Database Systems", Narosa Publishing House, New Delhi.
2. Elimsari And Navathe, "Fundamentals of Database Systems", Addison Wesley, New York.
3. Ullman, J.D , "Principals Of Database Systems", Galgotia Publications, New Delhi.



**AD-105**

**PAPER V (Practical)  
Based on AD-103 & AD-104**

## Semester-II

AD-201

### Paper-I (Visual Basic )

#### Objectives:

This course introduces to the students the Visual Basic. Upon completion of this course, the student will be able to write non trivial VB programs dealing with a wide variety of subject matter domains. Topics include language components, the MDI,Event Driven programming , forms, strings.

#### Unit -1

The environment of Visual Basic :-

Menu bar , tool bar , project explorer , toolbox , property window , form designer, form layout , immediate window , use of application wizard , concept of vb project , designing , user interface

#### Event driven programming :-

Common properties , methods and common events.

#### Unit -2

Variables , declaring variables , converting variables types , user defined data types , Variables scope , constants , arrays , procedure , subroutines , function and arguments , conditional statements , loop statement , iteration.

#### Working with forms :-

Loading forms , showing and hiding forms , using form templates , menu , using messages Boxes , input dialog boxes , modules.

#### Unit -3

Menus & MDI: Objectives, Building the User Interface, Overcrowding, Consistency, All about Menus, The Menu Systems, Menu Conventions, The Menu Editor, Using the Menu Editor, Writing Code for Menu Controls, Dialog Boxes, MDI Applications, Menu in MDI Applications, Adding Status Bar, Adding Tool Bar, Adding Data File.

#### Unit-4

Graphics in Visual Basic Form , picture box , image box , sizing images , coordinate system , scale properties And methods , drawing curves , drawing pixels , drawing boxes , fillings . timer control MDI form and their properties interfacing with other packages.

#### Unit-5

VB interfacing with other packages.

VB interfacing with MS Access

VB interfacing with Oracle

Package and deployment wizard

Creation of setup files

#### References:

1. Programming in Visual Basic 6.0 , Bradly(TMh).
2. Visual Basic 6: Forms and Groundup , Cornell(TMh).
3. Mastering Visual Basic 6 (BPB).
4. Working in Microsoft Office - Richard Mansfield - Tata McGraw Hill Education.

**Paper II (Object Oriented Analysis & Design through Java )**

**Objectives:**

This course offers the modern programming language JAVA that will help the students to implement the various concept of object orientation practically. The students will be able to program in the object-oriented technology with the usage of JAVA

**Unit I**

**Object Oriented Analysis and Design**

Fundamentals of object-oriented programming – procedure-oriented programming Vs. Object oriented programming (OOP), Object oriented programming concepts – Classes, object, object reference, abstraction, encapsulation, inheritance, polymorphism.

**Overview of Java language**

C++ Vs Java and internet , internet , Java and WWW , java support systems , java support system , java environment , java program structure , tokens , statement , 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 , bit-wise 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.

**Unit II**

**Classes objects and methods**

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

**Unit III**

**Arrays, strings and vectors**

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.

**Unit IV**

**Multithreaded Programming**

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

**Unit V**

**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.

**Suggested Readings**

1. Learn java Now-Davis , R. Stephen(Microsoft Press).
2. Java 2,The Complete Reference - Herbert Schildt(TM).

3. JAVA Elements : Principals of programming in java-Bailey(TM).
4. The Java programming language – Ken Arnold , James Gosling(Pearson Education).
5. Programming with java E : Balagurusamy(TM).

**AD-203**

**Paper-III (Overviews of Internet & Web designing)**

**Objectives:**

The course is designed to understand about Internet, setting –up a dial up connection, HTML, CSS and Bootstrap in web designing.

**UNIT-I**

**INTERNET :**

Basic concept of networking- Issues in networking Protocol, TCP /IP and LAN & WAN . software and hardware components that build the network, network topology, Basic structure of intranet, features supported by internet, security aspect of the internet, method of access to internet server, types of internet connection, ISP, DNS and IP addressing, Search Engines, Web Browsers.

**UNIT-II**

**Features of Internet**

E-mail, popular e-mail systems and e-mail protocol software, Newsgroup, moderated and un-moderate news group, subscribing and unsubscribing newsgroup, principles of file transfer , ftp sites, anonymous ftp and ftp software , Telnet , setting up telnet, applications of telnet, www, video conferencing , push technologies.

**UNIT-III**

**HTML**

HTML Document, Basic Structure of HTML, Syntax, HTML Tags and Attributes, Types of HTML Tags, Rules of nesting, Basic Tags (HTML Tag. Head Tag, Title Tag, Body Tags).

**Page Formatting:**

Adding a new Paragraph, Adding a line break, Inserting a blank space , changing page background , Div and Span tags

**Text Formatting:**

Html Headings, Formatting elements (<b> Bold text ,<strong> Important text ,<i> Italic text , <em> Emphasized text , <mark> Marked text, <small> Small text, <del> Deleted text, <ins> Inserted text, <sub> Subscript text, <sup> Superscript text), Comments, Horizontal Lines

Creating Lists: Ordered List, Unordered Lists, Definition Lists.

Others:

Images, Text Links, Image Links, opening a page in New Window or Tab, Linking to an area of same page, Introduction to Table Tags, Advantages and limitations of tables, Frames & IFrame, HTML Forms .

**UNIT-IV**

**Cascading Style Sheets**

Introduction, Benefits of CSS, CSS Syntax, CSS Implementation (inline, internal and external), CSS Selectors (ID Selectors, Class Selectors, Grouping Selectors, Universal Selectors, CSS Pseudo-classes), CSS properties (background-color, background-image, border-style, height, width, color, text-align, font-family, font-style, font-size, font-weight), Box Model in CSS(margin, border, padding)

**UNIT-V**

**Bootstrap**

Color Management, Buttons, Table, drop-down, navigation-bar, images, pagination, jumbotron, alerts, forms, progress bar, grid, utilities & filters.

**References:**

1. Head First HTML and CSS: A Learner's Guide to Creating Standards-Based Web Pages , O Reilly Publications by Elisabeth Robson Eric Freeman
2. Web Technologies, Black Book ,Kogent Learning Solutions Inc
3. Developing Web Applications, 2ed ,Wiley Publications, M.T.Savaliya
4. Mastering Bootstrap 4 ,by Benjamin Jakobus and Jason Marah, Packt Publishing
5. The internet complete reference : Hahn TMH
6. Internet book : Comer PHI
7. Internet : Complete reference : Young TMH

**AD-204**

**PAPER IV (Practical)**  
**Based on AD--201,AD-202, AD-203**

**AD-205**

**PAPER V (Industrial Training & Project Viva)**

**Objectives:**

The course is designed to understand about IT, IPR and Ethical and Legal Issues in Internet Broadcasting

**Unit-I**

Brief history of new media, Characteristic of new media, principle of new media, digital entertainment culture.

**Unit-II**

- Information Revolution
- History of Information Technology in India
- Internet, Civil Society and Social Movements
- Globalization and Digital Journalism

**Unit-III**

- I.P.R. and Internet
- Ethical and Legal Issues in Internet Broadcasting
- Types of Web Journalism

**Unit-IV**

- Tools of New Media
- Interactivity and New Media
- Digital Media Design
- Assignments

**UNIT-V**

Cyber space and cyber culture, evolution of social media and social network sites.

**References:**

- 1.Flew,T. (2014). New Media: An introduction. South Melbourne, Vic.: Oxford University Press.
- 2.Lister, M. (2010). New Media: A critical Introduction. London: Routledge.