POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS (P.G.D.C.A.)

SEM.	COURSE CODE	COURSE	COURSE TITLE	HRS / WEEK	CREDIT	CIA MARKS	SE MARKS	TOTAL MARKS
I	14PDCA1C1	CORE I	Digital Computer Fundamentals	6	4	40	60	100
	14PDCA1C2	CORE II	Programming in C	6	4	40	60	100
	14PDCA1C3	CORE III	Principles of Operating Systems	6	4	40	60	100
	14PDCA1C4	CORE IV	Database Systems	6	4	40	60	100
	14PDCA1C5P1	CORE V (A)	C Programming Lab	3	2	20	30	50
	14PDCA1C5P2	CORE V (B)	PC Packages Lab	3	2	20	30	50
	TOTAL			**30**	**20**	**200**	**300**	**500**
II	14PDCA2C6	CORE VI	Internet and its Applications	6	4	40	60	100
	14PDCA2C7	CORE VII	Object Oriented Programming with C++	6	4	40	60	100
	14PDCA2C8	CORE VIII	Visual Programming	6	4	40	60	100
	14PDCA2C9	CORE IX	Web Design	6	4	40	60	100
	14PDCA2C10P1	CORE X (A)	C++ Programming Lab	3	2	20	30	50
	14PDCA2C10P2	CORE X (B)	Visual Programming Lab	3	2	20	30	50
	TOTAL			**30**	**20**	**200**	**300**	**500**
GRAND TOTAL				**60**	**40**	**400**	**600**	**1000**

SEMESTER – I : CORE - I
DIGITAL COMPUTER FUNDAMENTALS

Course Code : 14PDCA1C1 **Max. Marks : 100**
Hours/Weeks : 6 **Internal Marks : 40**
Credit : 4 **External Marks: 60**

Objective

To acquire a thorough knowledge in the various concepts of digital computers and their fundamentals.

UNIT I **18 hours**

Number Systems: Decimal System – Counting in The Binary System – Binary Addition – Subtraction – Multiplication – Division – Converting Decimal to Binary – Use of Compliments To Represent Negative Numbers – Binary Number Complements – BCD Number Representation – #Octal and Hexadecimal Number Systems#.

UNIT II **18 hours**

Boolean Algebra and Gate Networks: Fundamental Concepts of Boolean Algebra – AND Gates and OR Gates- #Complementation and Inverters# – Evaluation of Logical Expressions – Basic Laws of Boolean Algebra – De Morgan's Theorem – Sum of Products and Product of Sums – NAND and NOR Gates – Map Method For Simplifying Expressions.

UNIT III **18 hours**

Logic Designs: Flip-Flops – Clocks – Flip-Flop Designs – Gated Flip-Flops- Master Slave Flip-Flop – Shift Register - Binary Counter – #BCD Counters#– Integrated circuits.

UNIT IV **18 hours**

The Arithmetic Logic Unit: The Construction of The ALU – Binary Half-Adder – A Parallel Binary Adder – Addition and Subtraction in a Parallel Arithmetic Element – Full-Adder Designs – BCD Adder – Multiplexers.

UNIT V **18 hours**

Memory Unit: Random Access Memories – Decoders – Static and Dynamic Random Access Memories – Read Only Memories – Magnetic Disk Memories – #Flexible-Disk Storage Systems–The floppy Disk# – Magnetic Bubble and CCD Memories.

 # ..... # self-study portion

Text Book

Thomas C. Bartee, *Digital Computer Fundamentals,* TMH, Sixth Edition, 1991.
UNIT I : Chapter-2 Section (2.1, 2.3-2.6, 2.8, 2.10-2.12)
UNIT II : Chapter-3 Section (3.1, 3.3-3.5, 3.7, 3.10, 3.14, 3.17, 3.18)
UNIT III: Chapter-4 Section (4.1, 4.3-4.10)
UNIT IV: Chapter-5 Section (5.1, 5.3-5.5, 5.9, 5.11, 5.20)
UNIT V : Chapter-6 Section (6.1, 6.3, 6.6-6.11, 6.14)

Books for Reference

1. B. Ram, Computer Fundamentals (Architecture and Organization), New Age International Pvt. Ltd. Publishers, Second Edition, 1999.
2. Albert Paul Malvino and Donald. P Leach, Digital principles and Applications, TMH, Fourth Edition, 1991.

SEMESTER – I : CORE - II
PROGRAMMING IN C

Course Code : 14PDCA1C2 **Max. Marks : 100**
Hours/Week : 6 **Internal Marks : 40**
Credit : 4 **External Marks: 60**

Objective

To provide complete knowledge in the concepts of programming in C language.

UNIT I **18 hours**

Overview of C: Introduction-Sample C program – Basic Structure of C Program – keywords and identifiers – constants – #variables# – data types.

UNIT II **18 hours**

Operators, Expressions and I/O operations: Arithmetic operators – relational operators –Assignment operators – #Increment and decrement operators# – Conditional operators –Bitwise operators – evaluation of expressions I/O operations: getc( ), putc( ), scanf( ), printf( ) functions

UNIT III **18 hours**

Decision Making and looping: If statement – If…Else statement – Else..If ladder – Switch statement – While statement – #For statement#

UNIT IV **18 hours**

Arrays and pointers: One dimensional arrays – Two dimensional arrays. Functions: User defined functions – Built-in Functions – Return values and their types – calling a function – Recursion – Structures – Unions. Pointers: Understanding pointers – declaring and initializing pointers

UNIT V **18 hours**

File Management in C: Defining and opening a file – closing a file – #I/O operations# –Random access to files-programming example.

 # ..... # self-study portion

Text Book

1. E. Balaguruswamy, *Programming in ANSI C*, TMH, Second Edition, 45th Reprint, 2001.

Books for Reference

1. B.S. Gottfried, Programming with C, Schuams outline series, TMH Edition, 1997.

SEMESTER – I : CORE - III
PRINCIPLES OF OPERATING SYSTEMS

Course Code : 14PDCA1C3 **Max. Marks : 100**
Hours/Week : 6 **Internal Marks : 40**
Credit : 4 **External Marks: 60**

Objective

To Acquire a Thorough Knowledge in Memory Management, Processor Management, Device Management and Information Management of OS.

UNIT I **18 hours**

Introduction: Importance of Operating Systems – Operating System Resource Manager – Operating Systems-Hierarchical and extended Machine View – Other Views of an Operating System – General Design Considerations. I/O Programming: Types of I/O Channels – #I/O Programming Concepts# – I/O Processor Structure-360 & 370 – Communication Between CPU and Channel – I/O Example Using Single Buffering – I/O Example Using Double Buffering – Multiple card Buffering. Interrupt Structure and Processing: Interrupt Types – #Interrupt Mechanism# – Interrupt Handlers.

UNIT II **18 hours**

Memory Management: Single Contiguous Allocation – Partitioned Allocation – Relocatable Partitioned Memory Management – Paged Memory Management – Demand-Paged Memory Management – Segmented Memory Management – #Segmented Demand#-Paged Memory Management

UNIT III **18 hours**

Processor Management: State Model – #Job Scheduling# – Process Scheduling – Synchronization – Multiprocessor Systems.

UNIT IV **18 hours**

Device Management: Techniques for Device Management – Device Characteristics – Channels and Control Units – Device Allocation considerations – Virtual Devices.

UNIT V **18 hours**

Information Management: A Simple File System – General Model – Symbolic File System – Basic File System – #Logical File System# – Physical File System.

 # ..... # self-study portion

Text Book

1. Stuart E. Madnick and John J. Donovan, *Operating Systems*, TMH, 14th Reprint, 2007.

UNIT I : Chapter : 1 , 2
UNIT II : Chapter: 3
UNIT III : Chapter: 4
UNIT IV : Chapter: 5
UNIT V : Chapter: 6

Books for Reference

1. William Stallings, Operating Systems, PHI, Second Edition, 2001.

SEMESTER – I : CORE - IV
DATABASE SYSTEMS

Course Code : 14PDCA1C4 **Max. Marks : 100**
Hours/Week : 6 **Internal Marks : 40**
Credit : 4 **External Marks: 60**

Objective

To acquire a thorough knowledge in all the concepts of database systems.

UNIT I **18 hours**

Introduction: The Evolution of Database Systems – Architecture of a DBMS – The Future of Database Systems – Database Modeling: Introduction to Object Definition Language – E/R Diagrams –#Design Principles# – Subclasses – Weak Entity Sets – Models of Historical Interest.

UNIT II **18 hours**

The Relational Data Model: Basics of the Relational Model – Functional Dependencies – Rules about Functional Dependencies – #Multivalued Dependencies#.

UNIT III **18 hours**

Operations in the Relational Model: An Algebra of Relational Operation – A Logic for Relations – From Relational Algebra to Datalog – Constraints on Relations – Other Extension to the Relational Model.

UNIT IV **18 hours**

Database Language SQL: Simple Queries in SQL – Queries Involving More Than One Relation – Sub Queries – Duplicates - Aggregation – Database Modifications – Defining a Relation Scheme in SQL – #View Definition#

UNIT V **18 hours**

Constraints and Triggers in SQL: Keys in SQL – Referential Integrity and Foreign Keys. – Triggers in SQL3 – #SQL in Programming Environment# – Object oriented query language: Query Related Fatures of ODL – Introduction to OQL.

 # ..... # self-study portion

Text Book

1. Jeffrey D.Ullman and Jennifer Widom, *A First Course in Database Systems*, Addison Wesley Longman Pvt. Ltd., 2001.

UNIT I Chapter I : Sections 1.1 – 1.3 , Chapter II : Sections 2.1 – 2.7
UNIT II Chapter III : Sections 3.1,3.5,3.6,3.8
UNIT III Chapter IV : Sections 4.1 – 4.5,4.7
UNIT IV Chapter V : Sections 5.1 – 5.8
UNIT V Chapter VI : Sections 6.1,6.2,6.6,7.1,8.1,8.2

Books for Reference

1. Ramez Elmasri – Shamkant B. Navathe, *Fundamentals of Database Systems,* Addison Wesley Longman Pvt. Ltd, Third Edition, 2001.
2. Alexis Leon and Mathews Leon, *Database Management Systems,* Vikas Publishing House Pvt. Ltd, 2002.

SEMESTER – I : CORE - V (A)
C PROGRAMMING LAB

Course Code : 14PDCA1C5P1 **Max. Marks : 50**
Hours/Week : 3 **Internal Marks : 20**
Credit : 2 **External Marks: 30**

1. Sorting of numbers and names
2. Pascal triangle
3. Finding the roots of Quadratic equation
4. String Manipulations
5. Matrix manipulations
6. Finding the largest and smallest from a list given N numbers
7. Inventory updating using pointers
8. File processing
9. Mark Sheet processing using file manipulation
10. Electricity bill preparation using files.

SEMESTER – I : CORE – V (B)

PC PACKAGES LAB

Course Code : 14PDCA1C5P2 **Max. Marks : 50**
Hours/Week : 3 **Internal Marks : 20**
Credit : 2 **External Marks: 30**

MS-WORD

1. Prepare Bio-data using Text Manipulation.
2. Prepare a document in a newspaper format.
3. Table Creation.
4. Mail merge.

MS-EXCEL

1. Mark sheet Preparation
2. Data Sorting
3. Inventory Preparation
4. Pay bill Preparation
5. Drawing Graphs.

MS-POWERPOINT

1. Inserting Clip and Pictures.
2. Insertion of new slides
3. Slide Show.

SEMESTER – II : CORE - VI
INTERNET AND ITS APPLICATIONS

Course Code : 14PDCA2C6 **Max. Marks : 100**
Hours/Week : 6 **Internal Marks : 40**
Credit : 4 **External Marks: 60**

Objective

To present the fundamental concepts of Internet, Internet Technologies.

UNIT I **18 hours**

Internet- An Introduction: Introduction-What's Special about the Internet? – You don't have to be a Mechanic to Drive a Car!-Internet Access/Dial-Up Connection – Internet Services Features-Getting Connected: Introduction – TCP/IP Vs shell accounts - Account details VSNL – #Configuring the machine for the TCP/IP account# – Configuring the shell account.

UNIT II **18 hours**

The World Wide Web (WWW):Introduction – Web Page – Net Surfing – Internet/Web Browsing: Introduction – Microsoft Internet Explorer – Viewers – #Favorites3 – Netscape Navigator-Lynx.

UNIT III **18 hours**

Internet Addressing: What is Internet Addressing? – IP Address – Domain Name – Electronic Mail – Uniform Resource Locator (URL) – Internet Protocols**:** Introduction –Transmission Control Protocol/Internet Protocol (TCP/IP) – #File Transfer Protocol (FTP)#.

UNIT IV **18 hours**

Hypertext Transfer Protocol (HTTP) – Telnet – Gopher – WAIS – Beyond Surfing –Searching the Web: Introduction – Web Index – Web Search Engine – Web Meta –Searcher.

UNIT V **18 hours**

Electronic Mail (E-Mail): Introduction – E-Mail Messages – Pine-Finding an E-Mail Address – Mailing Lists – Smileys – E-Mail Ethics (Netiquette) – E-Mail – Advantages and Disadvantages – Some Useful E-Mail Services – #Creating Your Presence on the Web:Introduction#.

 # ..... # self-study portion

Text Books

1. Alexis Leon and Mathews Leon, Internet for everyone, Vikas publications House Pvt. Ltd., 1998.

UNIT I **:** Chapter 1 , Chapter 2
UNIT II **:** Chapter 3 , Chapter 4
UNIT III **:** Chapter 5 , Chapter 6
UNIT IV **:** Chapter 6 , Chapter 7
UNIT V **:** Chapter 8 , Chapter 9

Book for Reference

1. C. Xavier, World Wide Web Design With HTML, Tata McGraw Hill, 22nd Reprint, 2010**.**

SEMESTER – II : CORE - VII
OBJECT ORIENTED PROGRAMMING WITH C++

Course Code : 14PDCA2C7 **Max. Marks : 100**
Hours/Week : 6 **Internal Marks : 40**
Credit : 4 **External Marks: 60**

Objective

To get adequate knowledge in Object Oriented Programming concepts and developing programming skills efficiently using C++.

UNIT I **18 hours**

Principles of Object Oriented Programming: Basic Concepts of Object Oriented Programming – Benefits of OOP – Applications of OOP – Structure of C++ Program – Control Structures. **Functions:** Function Prototyping – Call by Reference – Return by Reference – Inline Functions – Default Arguments – #Function Overloading#.

UNIT II **18 hours**

Classes and Objects: Specifying a Class – Defining Member Functions – Static Data Members – Static Member Functions – #Arrays of Objects# – Objects as Function Arguments– Returning Objects – Friend Function.

UNIT III **18 hours**

Constructors and Destructors: Constructors - Parameterized Constructors – Copy Constructors – Destructors. Operator Overloading: – #Defining Operator Overloading# – Overloading Unary Operators – Overloading Binary Operators – Overloading Binary Operators using Friends – Rules for Overloading Operators.

UNIT IV **18 hours**

Inheritance: Extending Classes – Defining Derived Classes – Single Inheritance – Multilevel Inheritance – Multiple Inheritance – Virtual Base class - Pointers to Objects – this Pointer – Pointers to Derived Classes – Virtual Functions – Pure Virtual Functions.

UNIT V **18 hours**

Managing Console I/O Operations: C++ Streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operations. Working with Files: Classes for File Stream Operations – Opening and Closing a File –File Opening Modes- Detecting End-of-file.

 # ..... # self-study portion

Text Book

1. E. Balagurusamy, *Object-Oriented Programming with C++,* Tata McGraw Hill Education Private Ltd., New Delhi, Fourth Edition, 2008.

UNIT I : Section 1.5,1.6,1.8,2.6,3.24,4.3,4.4,4.5,4.6,4.7,4.9
UNIT II : Section 5.3,5.4,5.11 to 5.16
UNIT III : Section 7.2 to 7.7
UNIT IV : Section 8.2 to 8.9 , 9.3 to 9.7
UNIT V : Section 10.2 to 10.5,11.2 to 11.5

Books for Reference

1. Herbert Schildt, Teach Yourself C++, Tata McGraw Hill Education Private Ltd., New Delhi, Third Edition, 1999.

SEMESTER – II : CORE - VIII
VISUAL PROGRAMMING

Course Code : 14PDCA2C8 **Max. Marks : 100**
Hours/Week : 6 **Internal Marks : 40**
Credit : 4 **External Marks: 60**

Objective

To provide fundamental concept of the Visual Basic language.

UNIT I **18 hours**

The Visual Basic Environment : The initial Visual Basic screen – The SDI Environment – Toolbars – The Toolbox – The initial form window – Project Explorer – Menu bar – Starting a new project – The properties window – common form properties – making a form responsive – #saving the project#.

UNIT II **18 hours**

Building the User Interface: Creating controls – The Name property – Anatomy of a Visual Basic Application – The code window – Statements in Visual Basic – Variables – Data types – Working with variables – constants – Determinate Loops – Indeterminate Loops – Making Decisions – #Select Case# – Nested If.

UNIT III **18 hours**

Built-In Functions: String Functions – Numeric Function – Financial Function – Function Procedures – Sub Procedures – #Passing by Reference# – Passing by Value – Subprograms – Arrays – Fixed Vs Dynamic Arrays – Static Arrays – Assigning Arrays – Arrays with more than one dimension- Control Arrays.

UNIT IV **18 hours**

Windows Common Controls: Common Dialog Boxes – Rich Text Box – Image list control – List View control – Progress Bar Control - Slider control – Status Bar Control – Tab Strip Control – Tool Bar Control - Tree View Control – File System Controls – Menu Editor – #MDI Forms#.

UNIT V **18 hours**

Database Development: Using the Data Control – Methods and Events for the Data Control – Monitoring changes to the Database – The Data Form Wizard – ActiveX Controls – Testing the control – Adding the functionality – The life cycle of a control.

 # ..... # self-study portion

Text Book:

1. Gary Cornell, *Visual Basic 6 from the Ground Up*, Tata McGraw Hill Edition, 2008

UNIT I : Chapter 2 & 3
UNIT II : Chapter 4, 5 & 6
UNIT III : Chapter 8 , 9 & 10
UNIT IV : Chapter 14 & 19
UNIT V : Chapter 22 & 23.

Books for Reference:

1. Mohamed Azam, Programming with Visual Basic 6.0, Vikas Publishing House Pvt. Ltd., 2009.

SEMESTER – II : CORE - IX
WEB DESIGN

Course Code : 14PDCA2C9 **Max. Marks : 100**
Hours/Week : 6 **Internal Marks : 40**
Credit : 4 **External Marks: 60**

Objective

To learn the basic concepts of web design. The course gives a basic idea of designing a web page using HTML. At the end of the programme the students will be able to design some static web pages.

UNIT I **18 hours**

Introduction to the Internet : Electronic mail – Resource Sharingr – Remote Login – World Wide Web – Search Engine – Browsers – Introduction to static , dynamic and active web pages. Introduction to HTML: Designing a Home page-History of HTML-HTML Generations-HTML Documents-Anchor Tag-Hyper links-#Sample HTML documents#.

UNIT II **18 hours**

Head and Body Sections : Header Section-Title-Prologue-Links-Colorful Web page- Comments Lines. Designing the Body Section: Heading - Printing-Aligning the Headings-Horizontal Rule-Paragraph-#Tab Settings#-Images and Pictures-Embedding PNG Format Images.

UNIT III **18 hours**

Ordered and Un Ordered Lists: Lists-UnOrdered Lists-Headings in a List-Ordered Lists-Nested Lists. Table Handling: Tables-Tables creation in HTML-width of the Table and Cells-Cells Spanning Multiple Rows/Columns-Coloring Cells-Column Specification.

UNIT IV **18 hours**

DHTML and Style Sheets: Defining Styles-Elements of Styles- Linking a Style Sheet to an HTML Documents-In line Styles-Inernal and External Style Sheets-Multiple Styles Frames:Frameset Definition-#Frame Definition#-Nested Framesets.

UNIT V **18 hours**

Forms:Action Attribute-Method Attribute-Enctype Attribute-Drop down list-Check Boxes-Radio Buttons-Text Field-Text area-Password and Hidden Fields-Submit and Reset Buttons-#Designing Sample Forms#.

 # ..... # self-study portion

Text Book

1. C Xavier, *World Wide Web design with HTML,* Tata McGraw Hill Publishing Company Limited, 2001. ISBN 0-07-463971-4.

UNIT I : Chapters 1.4,1.7,1.9,3.1,3.2,4.1 to 4.7
UNIT II : Chapters 5.1 to 5.6, 6.1 to 6.7
UNIT III : Chapters 7.1 to 7.5, 8.1 to 8.6
UNIT IV : Chapters 9.1 to 9.7, 10.1 to 10.3
UNIT V : Chapters 12.1 to 12.5

Books for Reference

1. Robert W. Sebesta , Programming the World Wide Web, Pearson Education, Seventh Edition, 2007.

SEMESTER – II : CORE - X (A)
C++ PROGRAMMING LAB

Course Code : 14PDCA2C10P1	**Max. Marks : 50**
Hours/Week : 3	**Internal Marks : 20**
Credit : 2	**External Marks: 30**

1. Programs using Functions that pass and receive objects.
2. Programs using constructors and destructors.
3. Programs using Constructor overloading
4. Programs using function overloading
5. Programs using operator overloading
6. Programs using inheritance
7. Programs using virtual functions
8. Programs using friend functions
9. Programs using templates
10. Creation and processing of student and employee files.

SEMESTER – II : CORE - X (B)
VISUAL PROGRAMMING LAB

Course Code : 14PDCA2C10P2	**Max. Marks : 50**
Hours/Week : 3	**Internal Marks : 20**
Credit : 2	**External Marks: 30**

1. Developing a Scientific calculator
2. Develop Free hand drawing
3. Image Manipulation
4. Design a Menu
5. Employee Information System
6. Pay Bill preparation
7. Simple Mark Sheet Processing
8. Simple Banking Transaction
9. Develop a Text Editor using common dialog Box
10. Develop a Text Editor without using common dialog Box