

Maharishi University of Management & Technology, Bilaspur (Chhattisgarh)



**FACULTY OF COMPUTER SCIENCE & INFORMATION
TECHNOLOGY (CSIT)**

Syllabus

Post Graduate Diploma in Computer Applications

2021

Syllabus

w.e.f. Session 2021

PGDCA SEMESTER – I

S.No	Paper Code	Paper No.	Name of Paper	Marks
1	PGDCA 101	I	Fundamental of Computer and Information Technology	100
2	PGDCA 102	II	PC packages and Tally ERP	100
3	PGDCA 103	III	Programming in C++	100
4	PGDCA 104	IV	Internet and HTML	100
5	PGDCA 105	V	Maharishi Vedic Science	100
6	PGDCA 106	VI	Practical Work- PGDCA 102,103,104	100
Total Marks				600

PGDCA SEMESTER – II

S.No	Paper Code	Paper No.	Name of Paper	Marks
1	PGDCA 107	I	Data Communication and Computer Network	100
2	PGDCA 108	II	Relational Database Management System (Oracle)	100
3	PGDCA 109	III	System Analysis & Design	100
4	PGDCA 110	IV	Unix Fundamentals And Shell Programming	100
5	PGDCA 111	V	Programming Using VB.Net	100
6	PGDCA 112	VI	Practical PGDCA108, 110 & 111.	100
7	PGDCA 113	VII	Project Work Assessment	100
Total Marks				700

Scheme of Examinations:**Internal assessment/ Assignment: 30 marks. External evaluation: 70 marks.****In External Theory Papers, students would be required to attempt SEVEN questions (out of Ten) of 10 marks each.**

Paper - I
COMPUTER FUNDAMENTALS AND INFORMATION TECHNOLOGY

UNIT - I :

Introduction to Computer and information technology: Brief history of development of computer and generations of computer. Computer system characteristics, Advantages and disadvantages of a computer, Block diagram of computer, Types of computer - Analog, Hybrid, digital, Micro, Mini, Mainframe, Super computer, Personal Computer, Types of PCs desktop, Laptop, Notebook, Palmtop, etc., Number systems (Binary, Octal, Decimal, Hexadecimal), Computer codes - ASCII, EBCDIC.

UNIT - II

Input devices : Keyboard, Mouse, Monitor, Trackball, Joystick, Electronic Pen, Touch Screen, Image Scanner, MICR, OCR, OMR, Bar Code reader, Digitizer, Electronic Card Reader, Voice Recognition, Vision Input System,
Output Devices: Monitors, Printers, Plotters, Screen Image Projector, voice response system.

UNIT - III

Main Memory (RAM, ROM, EPROM, Cache memory).
Secondary storage devices (Sequential and Direct Access Devices), Magnetic tapes, Magnetic Disk, Optical Disk, CD-ROM, DVD

UNIT-IV

Types of Software (System software, Application Software, Firmware), Computer Language (Machine, Assembly, High level), Assemblers, Compilers, and Interpreter. Types of assemblers- Single pass and Double pass.

UNIT-V

Computer Network and Security: Types of network (LAN, MAN, WAN etc.), Network Models, Protocols and Architecture, Topology, OSI reference model, TCP/IP reference model. Virus definition, type, effects, symptoms, Anti-virus program, virus prevention.

Reference Books:

1. Fundamentals of Computers by Reema Thareja, Oxford University Press
2. Computer Fundamentals, 6th edition by Pradeep K. Sinha, Priti Sinha, BPB Publications
3. Computers Today by A. Ravichandran, Khanna Book Publishing.

Paper - II
PC packages and Tally ERP

UNIT - I

Fundamentals of DOS and windows, Fundamental of DOS Booting process, POST Internal commands of DOS : Directory and file commands, date, time, ver., prompt, cls. External commands : x-copy, disk- copy, format, attrib, tree, move, Creating and executing batch files.

UNIT - II

Graphical User Interface, Windows as an operating system, Features of Windows, Version of windows, Components of windows desktop, Working with desktop icons, Changing the properties of desktop, Creating files and Folders in Windows, Performing file and folder operations (Creating, Reaming, Opening and viewing, copying and moving, deleting,) Windows Accessories (paint, calendar, calculator, notepad, Word Pad)

Introduction to word processing (MS-Word) : Advantages of word processing, Main features of MS-Word, Creating, Opening and saving a word document.

Applying text formatting (Changing Font and font size, Applying bold, Italic and Underline, Strikethrough, Subscript, Superscript, Changing colour text.)

Applying paragraph formatting (Setting Indent for paragraph, Adding a paragraph border, bullets) Printing the documents, Previewing a document, Inserting picture, Find, replace, Using mail merge, Working with tables.

UNIT - III

Introduction to Spreadsheet (MS-Excel) : Definition and advantages of electronic worksheet, Understanding workbook and worksheets, Exploring the Ms-Excel, user interface (Title Bar, Minimize/ Maximize, Close buttons, Formula Bar, Worksheet, Scroll bars, Status Bar etc.),

Entering data in worksheet, saving and opening a workbook, managing worksheets in workbook, renaming, deleting worksheet, Inserting and deleting rows and columns, Using Cut, Copy, Paste. Formatting Cell (font, text alignment etc.), auto calculate, auto complete, creating Lists, series, fill handle, Working with charts and Functions like SUM, ROUND, AVERAGE, CONCATENATE, LEN, LOWER, UPPER, FIND, NOW, TODAY, ABS, INT, MOD, SQRT, COUNT MAX, MIN.

Introduction to Power Point, Main components of power point interface (Title Bar, Minimize/ Maximize, Close buttons, Working Area, Scroll bars, Status Bar, Slide Pane, etc), creating presentations in different ways, Inserting new slide, Moving and deleting slides, saving presentation, Inserting image, shapes working with animations and transition effects, adding a transition style and sound, working with tables.

Introduction to MS-Access, database objects-Tables, Queries, Forms and Reports. Creating table, working with fields in a table, Inserting a new field, Entering records in a table.

UNIT-IV

Basic concept of Accounting, Financial statements, Financial Statement Analysis, Cost Center, basic Concepts of Inventory, Tally Configuration & INI Setup, data Directory & folders configuration, Single & multiple user , Tally Screen Areas, Quitting Tally, maintain Company data, basic Company Details- Create/Alter/ Select load/ Close a Company, Chart of Accounts, Company Features, and Configuration.

Create later & Display groups and ledgers, all accounting voucher Types, Accounting Voucher transactions, Account invoice Transactions, Excise Invoice, Import invoices, Transaction using bill wise details.

UNIT-V

Reports like balance sheet, profit & loss account, ratio analysis, trial balance, accounts books like cash/bank book, All ledgers group summary & vouchers, sales, purchase & journal registers.

Create, alter & display Stock groups and stock items , all inventory vouchers types and transaction inventory details in accounting vouchers.

Cheque printing, common printing options, different printing formats etc.

Reference Books:

1. Windows 8.1 Plain & Simple by Joli Ballew, Nancy Muir, PHI
2. Learning Microsoft Office 2013 by Ramesh Bangia, Khanna Book Publishing.
3. Accounting with Tally, Nandhini K.K., BPB Publications.
4. Using Tally by N.Satyapal, Khanna Book Publishers

Paper - III
PROGRAMMING IN C++

UNIT - I

Basic concepts of Object Oriented Programming : Objects, Classes, Data abstraction and Encapsulation, Polymorphism, Dynamic Binding, Message Passing, Procedure Oriented vs. Object Oriented Programming, Benefits and applications of OPP.

UNIT - II

Graduating to C++ : Program features and Structure of C++ program,
C++ Tokens : Keywords, Identifiers, Constants, Strings, Operators
C++ data types : Basic (Built-in) data types, User defined data types,
Operators and operator precedence,
Control Structures (Sequence, Selection, Loop), switch case, break, continue, arrays, pointers, operators overloading.

UNIT - III:

Functions:

Function prototyping, call by reference, return by reference, Inline functions, Default arguments, function overload, string handling functions.

UNIT - IV

Classes in C++:

Structure, specifying class, creating objects, accessing class members, Defining member functions, constructors, destructors.

UNIT-V

Inheritance:

Forms of inheritance : Single inheritance, Multiple Inheritance, Hierarchical Inheritance, Multilevel Inheritance, Hybrid Inheritance, virtual base class,
Polymorphism, static and dynamic binding, Virtual functions, abstract class, void pointer, friend class, friend function.

Reference Books:

1. C++ The Complete Reference by Herbert Schildt, TMH Publication
2. C++ by E.Balaguruswamy, TMH Publication
3. Programming in C++ by Kumar, TMH Publication.

Paper - IV
INTERNET AND HTML

UNIT - I

Introduction to Internet:

History of internet, what is the internet, advantages of internet, Minimum requirements for internet, ISP, Internet protocols, Internet Tools (FTP, Gopher, E-mail, Telnet, Newsgroup, www etc.), Bridges, Hub, Routers, Repeaters and Gateways, Modem, Types of connections - Dial up, leased ISDN, Broadband.

UNIT -II

World Wide Web :

About www, useful services of the www, web browsers, URL, types of web pages (Static & Dynamic), Domain name system, Search Engines, E-mail, Web Publishing, Principles of effective web page design.

UNIT - III

Introduction to HTML:

Origin, evolution and importance of HTML, elements of HTML, Head, Title

Body : background, bgcolor, link, vlink, alink, bgproperties, margin.

Anchor: href. Name, title.

Block formatting elements : font, heading, blockquote, line break, centre, marquee, list elements.

UNIT - IV:

Forms in HTML:

Input elements: Textbox, password box, check box, radio button, combo box, select elements, option element.

Information types elements: code, emphasis, keyboard, strong, boldface, italics, strike and subscript.

UNIT-V

Advanced HTML:

Table elements: border, cell spacing, width, height, align, bgcolor, border color, TR element, TD element, TH element, Col Element.

Frames : frame and frameset elements.

Reference Books:

1. Internet for Everyone by Alexis Leon and M. Leon, Vikas Publishing.
2. Internet for Dummies, Pustak Mahal, New Delhi.
3. HTML For Beginners The Easy Way available at html.com.

Paper Code: PGDCA 105
Paper - V
Maharishi Vedic Science

UNIT - I

Meaning & importance of Guru Pujan.

Meaning of meditation, Mann, Intelligence, Chitta, Ego, Thought.

UNIT - II

Name of forty areas of Vedic Science and their expression in Human Physiology and characteristics of consciousness.

Consciousness, types of consciousness, characteristics of higher stages of consciousness.

Maharishiji's effect on Society, Environment, Behaviour and Moral Values.

UNIT - III

Maharishi's Yoga, Transcendental Meditation- a general Introduction, Types of Speech, TM Sidhi Programme, Principle of Yoga Asanas and their Concept.

Meaning of "Yogastha Kuru Karmani" and "Gyanam Chetanayaam Nihitam".

UNIT – IV

Introduction : Maharishi Vedic Management.

Fundamental elements of Vedic Management – Totality

Introduction to Absolute theory of Maharishi Government.

UNIT – V

Theory of Ayurved.

Vedic Management and Leadership.

Reference Books:

1.Maharishi Sandesh Part I and II.

2. Chetna Vigyan by His Holiness Maharishi Mahesh Yogi Ji.

3. Dhyani Shailey by Brahmachari Dr.Girish Jii.

Paper Code: PGDCA 106
Paper – VI

Practical Work based on PGDCA 102,103,104

Paper Code: PGDCA 107
Paper – I

DATA COMMUNICATION & COMPUTER NETWORK

UNIT- I

Introduction to Data Communication– Network models, protocols and architecture, standards organizations, line configuration, topology, transmission mode, classification of networks, OSI reference model, TCP/IP model.

UNIT- II

Analog and digital signals, Data encoding, parallel and serial transmission, modems, transmission media: guided media, unguided media, transmission impairment, performance, Synchronous and asynchronous transmission.

UNIT- III

Multiplexing, LLC, error detection and correction, flow control, HDLC, LANs- applications, architecture, Ethernet, 802.3 LANs, token ring, FDDI, IEEE 802.6, circuit switching, packet switching, message switching, connection oriented and connectionless services.

UNIT- IV

Principles of internetworking– connection– oriented, connectionless, Routing concepts, routing algorithms– distance-vector routing, link state routing, shortest path routing. Congestion control, QOS, internetworking, network devices.

UNIT- V

Network security requirements and attacks, public key and private key encryption and digital signatures, digital certificate, firewalls, IDS (Intrusion Detection System)

Reference Books:

01. Computer networks– A.S. Tanenbaum. PHI
02. Data communication and networking – Behrouz A. Forouzan. TMH

Paper Code: PGDCA 108
Paper – II

RELATIONAL DATABASE MANAGEMENT SYSTEM (ORACLE)

UNIT- I

Overview of Database Management: Data, information, data independence, database administration roles, DBMS architecture, different kinds of DBMS users importance of data dictionary, contents of data dictionary, types of database languages. Data models: network, hierarchical, relational. Introduction to distributed database, client/server databases, object-relational databases, introduction to ODBC concept

UNIT- II

Relational Model: Entity relationship model as a tool for conceptual design-entities attributes and relationships. ER diagrams; concept of keys: candidate key, primary key, alternate key, foreign key; strong and weak entities, case studies of ER modeling generalization; specialization and aggregation, Converting an ER model into relational schema. Extended ER features, introduction to UML, Representation in UML diagram.

UNIT- III

Structured Query Language (SQL): Relational Algebra: select, project, cross product different types of joins (inner join, outer joins, self join); set operations, tuple relational calculus, domain relational calculus, simple and complex queries using relational algebra, stand alone and embedded query languages, introduction to SQL constructs (SELECT...FORM, WHERE... GROUP BY... HAVING ... ORDERBY...), INSERT, DELETE, UPDATE, VIEW definition and use, temporary tables, nested queries, and correlated nested queries, integrity constrains: Not null, unique, check, primary key, foreign key, reference, triggers.

UNIT- IV

Relational database design: Normalization concept in logical model; pitfalls in database design, update anomalies: functional dependencies join dependencies, Normal forms (1NF, 2NF, 3NF). Boyce code normal form, decomposition, multi-valued dependencies, 4NF, 5NF. Issues in physical design; concepts of indexes, file organization for relational tables, de-normalization, clustering of tables, clustering indexes.

UNIT- V

Introduction to Query processing and protection the database: parsing, translation, optimization, evaluation and overview of query processing. Protecting the database integrity, security and recovery, Domain constraints, referential integrity, assertion, triggers, security & authorization in SQL.

Reference Books:

01. Database system concept, H. Korth and A. Silberschatz, TMH
02. Data Base Management System, C.J. Date, Narosha Publication.
03. An Introduction to database systems – Bipin Desai, Galgotia Publication.
04. SQL,PL?SQL Evan Bayross (2nd edition) BPB publications.

Paper Code: PGDCA 109
Paper – III

SYSTEM ANALYSIS AND DESIGN

UNIT- I

The system concept: characteristics, elements and types of a system, the system development life cycle, considerations, for candidate systems prototyping. The role of system analyst.

UNIT- II

System planning and initial investigation: Information Gathering, information gathering tools. Structured analysis, the tools of structured analysis (DFD, Data Dictionary, Decision tree and Pseudo codes Decision Tables), PROS and CONS of each tool, system performance definition description of outputs, feasibility study. Cost/ Benefit analysis, Data analysis, Cost/ Benefit analysis, the system proposal.

UNIT- III

Stages of system design: Design methodologies, development activities, input design, output design forms design, types of forms, basics of form design layout considerations and forms control.

UNIT- IV

File structure: File organization, objectives of database, data structure, system testing and quality assurance, why system testing, what do we test for, the test plan quality assurance, trends in testing, role of data processing auditor, training and documentation.

UNIT- V

Implementing and software maintenance: conversion combating resistance to change, post implementation review, software maintenance, hardware/software selection and the computer contract, suppliers, procedure for hardware/software selection, financial considerations in selection, the computer contract system security disaster recovery planning.

Reference Books:

01. System analysis and design, Elias M. Awad, Galgotia Publication (P) Ltd.
02. System analysis and design, International Ed. Perry Edwards, McGraw Hill Pub.

Paper – IV

UNIX FUNDAMENTALS AND SHELL PROGRAMMING

UNIT - I

Operating system and Architecture, Main functions of operating system.

Types of operating system: Batch, Multitasking, Multiprogramming, Multi processing, Time sharing, Real Time.

UNIT - II

History of Unix, Structure of Unix, kernel, shell, Features and Benefit of Unix.

Unix basic commands (clear, main, banner, who am i)

Time and Date commands (Date, cal, sleep)

Unix file system commands (cat, cp, mv, ls, comm, cmp, diff)

Unix directory management commands (pwd, cd, mkdir, rmdir)

UNIT- III

Pipes and Filters in Unix : Need of piping,

Unix Filters : uniq, tr, grep

Sort (Sort by lines, Sort by fields)

Viewing long files (pg, more, head, tail)

Process Utilities (ps, kill)

Find Command

UNIT - IV:

Environment variables (HOME, PATH, PSI and LONGAME)

Types of users, Types of files (Ordinary Files, Directory Files, Device Files)

Files Access Permission, Types of Permissions, changing file permission, changing ownership, chmod.

Redirection, Standard input, output and error files, input, output and error redirection.

UNIT - V

Vi editor, Shell scripts: Simple shell scripts using expr

shell input & output (echo, read)

Operators (Arithmetic Operators, Relational Operators, Boolean Operators, String Operator s, File Test Operators)

Conditional statements (If-else-elif, Test command, case-esac)

Loops (While, For, Until, Break & continue)

Reference Books:

1. Introduction To Unix And Shell Programming by Venkateshmurthy, PEARSON INDIA
2. Unix and Shell Programming by Archana Verma, Laxmi Publications
3. UNIX & Shell Programming by Bintu Harwanj, Oxford University Press.

Paper Code: PGDCA 111
Paper – V

Programming Using VB .NET

UNIT I:

Introduction to .NET: - NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser. The environment: Editor tab, format tab, general tab, docking tab. visual development & event drive Programming -Methods and events.

UNIT II:

The VB.NET Language: - Variables -Declaring variables, Data Type of variables, Forcing variables declarations, Scope & lifetime of a variable, Constants, Arrays, types of array, control array, Collections, Subroutines, Functions, Passing variable Number of Argument Optional Argument, Returning value from function. Control flow statements, conditional statement, loop statement. MsgBox & Inputbox

UNIT III:

Object oriented Programming: - Classes & objects, fields Properties, Methods & Events, constructor, inheritance. Access Specifiers, Public Private, Protected. Overloading, Friend, Overloading Vs Overriding, Interfaces, Polymorphism, My Base & My class keywords. Overview of OLE, Accessing the WIN32 API from VB.NET & Interfacing with office 97, COM technology, advantages of COM+, COM & .NET, Create User control, register User Control, access com components in .net application.

UNIT IV:

Working with Forms: - Loading, showing and hiding forms, controlling one form within another. GUI Programming with Windows Form: Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, RadioButton, Panel, scroll bar, Timer, ListView, TreeView, toolbar, StatusBar. There Properties, Methods and events. OpenFileDialog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog. Link Label. Designing menus, ContextMenu, access & shortcut keys, System.io Namespace, Reading and Writing data from and into files, File class and related Methods, Stream Reader, Stream Writer, Binary Reader, Binary Writer class, File and Directory Classes.

UNIT V:

Databases in VB .NET: - Database : Connections, Data adapters, and datasets, Data Reader, Connection to database with server explorer, Multiple Table Connection, Creating Command, Data Adapter and Data Set with OLEDB and SQLDB. Display Data on data bound controls, display data on Data grid. Data binding with controls like Text Boxes, List Boxes, Data grid etc. Navigating data source, Data Grid View, Data form wizard, Data validation, Connection Objects,

Command Objects, Data Adapters, Dataset Class, Overview of ADO, from ADO to ADO.NET, Generate Reports Using Crystal Report Viewer. Crystal Report : Connection to Database, Table, Queries Building, Report, Modifying Report, Formatting Fields and Object, Header, Footer, Details, Group Header, Group footer, Working with formula fields, Parameter fields, Group, Special fields, Working with Multiple Tables, SQL in Crystal Report, Report Templates.

Reference Books:

1. VB.NET Programming Black Book by Steven Holzner – Dreamtech Publications.
2. Mastering VB.NET by Evangelos Pet Routsos- BPB publications.
3. Introduction to .NET framework-Worx Publication.

Paper Code: PGDCA 112

Paper – VI

Practical Work based on PGDCA 108,110 & 111

Paper Code: PGDCA 113

Paper – VII

Project Work