

VIKRAM UNIVERSITY, UJJAIN

INSTITUTE OF COMPUTER SCIENCE

PROGRAMME TITLE: PG Diploma in Modern Programming Languages

PROGRAMME OBJECTIVES:

The objective of the PG Diploma in Modern Programming Languages programme is to prepare students for productive careers in the software industry . Basic qualification is bachelor's degree in any subjects.

This PG Diploma in Modern Programming Languages programme has been designed with a 1 year (Two Semesters) programme approach in mind. In 1 year diploma courses are aimed at skills development in computers using various technologies and Programming Language skills. To learn, experiment, and explore Programming Language in education and How to use and manage the computer as a business and personal tool through the use of applications software.

The main objectives of the Diploma in Modern Programming Language programme includes:

- Learn Fundamental of Programming Language and basics of computer technology.
- To develop in depth understanding of the key concepts of Programming Language to impart knowledge of problem solving techniques, C,C++,Core Java,HTML.
- Develop problem solving skills in interdisciplinary domains.
- Focus on development of knowledge and specific skills required in Programming Language Python.
- To develop competent computer professionals with strong ethical values.

PROGRAMME OUTCOMES (POs)

At the end of this Diploma in Modern Programming Language programme, student will be able to:

- Prepare software's and web pages on computer system.
- Demonstrate strategies for merging and integrating source data from multiple applications.
- Gain understanding of the key programming language skills.
- Understanding the key concepts of Programming Language to improvise organizational performance.

After Completion of the programme students are able to work as-

- Software Developer.
- Data base Administration.
- Strategy Designer in IT Organization.
- Language Programmer.
- Web Application Developer.

First Semester

Paper Code	Title Of Paper	Theory Exam	Minimum Pass Marks (in theory)	Internal Marks	Minimum Pass Marks	Total
1001	Fundamental of Information Technology	70	25	30	11	100
1002	PC-Packages	70	25	30	11	100
1003	Programming and Problem Solving in C	70	25	30	11	100
1004	Digital computer Organization	70	25	30	11	100
1005	Modern Technologies of Computer Science	70	25	30	11	100
		350		150		500

Second Semester

Paper Code	Title Of Paper	Theory Exam	Minimum Pass Marks (in theory)	Internal Marks	Minimum Pass Marks	Total
2001	HTML	70	25	30	11	100
2002	JavaScript	70	25	30	11	100
2003	SQL	70	25	30	11	100
2004	DBMS	70	25	30	11	100
2005	Python Programming Language	70	25	30	11	100
		350		150		500

I- SEMESTER

PAPER- I: FUNDAMENTAL OF INFORMATION TECHNOLOGY

UNIT-1

Computer Fundamental: Characteristics of Computers, History of Computer, Evolution of Computers, Computer Generations and Types of Computer. **Components of a Computer:** Registers, instruction Set, Bus Architecture. **Computer Hardware:** Input Devices, Output Devices. **Storage Devices:** Primary Storage capacity, Memory Types, Memory Measuring Units, Secondary Storage. Software & Software Types, Computer Languages, Compiler, Interpreter.

UNIT-2

Introduction of Programming: Procedure Oriented Programming, Object oriented programming, Concepts used in OOP, Benefits of OOP, Main advantages and disadvantage of OOP, Applications of OOP, OOP vs. POP.

UNIT-3

Operating System Overview: Computer System Startup, Computer System Structure, computer system components, operating System classifications, operating System Services, Major Functions of operating system, Process Management, CPU Scheduling, Scheduling Criteria. **Memory and File Management:** Memory Management Requirements, Swapping, Memory Management Techniques.

UNIT-4

Introduction to DBMS: File System, Traditional File Oriented Approach, DBMS Advantages and Disadvantage, Role of DBMS, Three views of data, DBMS Architecture. Data Models, Data Independence, Major components of DBMS, Data Dictionary, Types of Users, DBMS applications, Keys in Databases, Database Languages.

UNIT-5

Introduction to computer Networks: computer Network Definition, Importance of Networking, Types of Networks, Network Topology, Advantages and Disadvantage of computer Networks, Applications of computer networks, Reference Model, Internet, introduction to Internet Technology, Electronic Mail, World Wide Web.

References:

1. Operating Systems Concepts, A. Silberschaz, P.Galvin, G.Gagne, John Wiley & Sons
2. Object Oriented Programming in C++, Robert Lafore, Galgotia Publication.
3. Data base management systems vol. 1., Date C.J.
4. Fundamental of Computer Science & IT, Singh Umesh Kumar, Jain S., Maheshwari A., SSDN publications New Delhi,
5. Data Communications and Networks, Godbole A, Tata Mccraw-Hill Publications.

PAPER- II: PC-PACKAGES

UNIT-1

MS windows: Introduction to MS windows; Features of windows; working with windows; My computer & Recycle bin; Desktop, Icons and windows Explorer; Screen description & working styles of windows; Dialog Boxes & Toolbar; working with files & Folders, Simple operations like copy, delete, moving of files and folders from one drive to another; Accessories and windows settings using control panel-setting common devices using control panel, modem, printers, audio, network, fonts, creating users, internet settings, Start button & program lists ;Installing and uninstalling new Hardware & software program on your computer.

UNIT-2

MS word Basics - Introduction to MS office; introduction to MS- word; Features & area of use, working with MS- word; Menus & commands; Toolbars & Buttons; shortcut Menus, wizards & Templates, creating a New Document; Different page views and Layouts; Applying various Text Enhancements; working with - Styles, Text .Attributes; paragraph and Page. Formatting; Text Editing using various features; Bullets, Numbering, Auto formatting, Printing & various print options.

UNIT-3

Advanced Features of MS- word- Spell check, Thesaurus, Find & Replace; Headers & Footers: Inserting- Page Number, Pictures, Files, Auto texts, Symbols etc.; working with columns, Creation and working with Tables including conversion to and from text; Margins and Space management in Documents.

UNIT- 4

MS Excel: Introduction and area of use; working with MS Excel: concept of workbook and worksheet; Using Wizards; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different views of Worksheet; Column Freezing, Labels, Hiding, Splitting etc.; Using different features of Data and Text; Use of Formulas, Calculation & Functions; Cell formatting including Borders and Shading; Working with Different Chart Types; Printing of Workbook & Worksheets with Various options.

UNIT-5

MS PowerPoint: Introduction and area of use; Working with MS PowerPoint; Creating a New Presentation; Working with Presentation; Using Wizards; Slides & its Different Views; Inserting, Deleting and Copying of Slides; Working with Notes, Handouts; Columns and Lists; Adding Graphics, Sounds and Movies to a slide; Working with PowerPoint Objects; Designing and Presentation of a Slide Show; Printing presentations; Notes, Handouts with print options.

References:

1. Windows XP Complete Reference. BPB publications
2. MS Office XP complete BPB Publication.

PAPER- III: PROGRAMMING AND PROBLEM SOLVING IN C

UNIT - 1

Problem identification analysis, design, coding, testing & debugging, implementation, modification & maintenance, algorithms & flowcharts, Characteristics of a good program - accuracy, simplicity, robustness, portability, minimum resource & time requirement, modularization; documentation, naming variables; Top down design; Bottom-up design.

UNIT 2

History of C, Structure of a C program, Data types, Constant & Variable, Operators & expressions, **Control Constructs** - if-else, for, while, do-while, Case statement, Arrays, Type modifiers & Storage classes, Ternary operator, Type conversion & type casting.

UNIT -3

Functions, Arguments, return value, Parameter passing - call by value, call by reference, return statement, Scope, visibility and life time rules for various types of variable, static variable, calling a function, Recursion - basics, comparison with iteration, tail recursion, when to avoid recursion examples.

UNIT 4

Special constructs - break, continue, exit , goto & labels; pointers - & and * operators, pointer expression, pointer arithmetic, String, Pointer to function, Function to parameter, structure - basic, declaration, membership operator, pointer to structure, referential operator, self-referential structures, structure within structure, array in structure, array of structures, Union - basic, declaration: Enumerated data type, Command line arguments.

UNIT 5

File handling and related functions: pprintf & family, c preprocessor- basics, # Include, # define, # undef, conditional compilation directive like #if, #else, #endif, #ifdef and #ifndef, Variable argument list functions.

Reference Books:

1. Kernighan & Ritchie: The C programming language, PHI
2. Cooper Mullish: The Spirit of C, Jaico publishing-House Delhi
3. Kanetkar Y: Let us C 4, Kanetkar Y: Pointers in C.

PAPER- IV: DIGITAL COMPUTER ORGANIZATION

UNIT-1:

Digital components: Functional units of a computer, logic gates, Minimization of Boolean Expressions, Flip-Flips, Decoders, Encoders, Multiplexers, Counters, and Registers.

UNIT-2:

Data Representation: Number systems, Representations of signed and unsigned numbers, alphanumeric codes, Addition of binary numbers, subtraction, 2's complement, and Floating point number representation.

UNIT-3:

Register Transfer Language & Micro-operations: Concepts of the Bus, Timings in Register transfer, Languages used for data transfer in registers, Data movement from/to memory.

UNIT-4:

Arithmetic circuits, Half adder, full adder, N-bit adder, Logical micro operation, arithmetic logic unit. Instruction sets for basic computer: Addressing modes, Instruction cycles, Control signal generation.

UNIT-5:

Central Processing Unit: General register organization, Memory stacks, Instruction types, Interrupts, Instruction pipelining, Arithmetic pipelining. .

Reference Books:

1. P. N. Basu, Computer Organization and Architecture, Vikas Publication, 2nd Edition.
2. H. Patterson, Computer Architecture: A Quantitative approach, Elsevier, 5th Edition.
3. W. Stalling, Computer Organization and architecture, Pearson Education Asia, 5th Edition.
4. Donald Leach & Albert Malvino, Digital Principles & Applications, McGraw Hill, 7th Edition.

PAPER- V: MODERN TECHNOLOGIES OF COMPUTER SCIENCE

UNIT 1:

Introduction to Computer Security: The Challenges of Computer Security, The OSI Security Architecture. Security Attacks (Passive Attacks, Active Attacks). Security Services (Authentication, Access Control, Data Confidentiality, Data Integrity, Nonrepudiation, Availability Service).

UNIT 2:

Introduction to Artificial Intelligence: What is AI ? The Importance of AI. AI and related fields. Introduction to Natural Language Processing., Application of AI.. Basic Problem solving methods: Production systems-state space search, control strategies, Breadth first search, Depth first search, Heuristic search.

UNIT 3:

Introduction to Machine Learning : Learning Problems - Perspectives and Issues - Concept Learning - Version Spaces and Candidate Eliminations - Inductive bias - Decision Tree learning - Representation Algorithm- Heuristic Space Search.

UNIT 4:

Introduction to IoT: Definition, Characteristics, Conceptual framework, Architectural view. Technology involved - Server-end technology, Hardware and Software components, Development tools & Open source framework, APIs & Device interfacing components, Platforms & Integration tools, Sources of IoT, Advantages and Disadvantages of IoT.

UNIT 5:

Introduction to Data Mining: Definitions, KDD v/s Data Mining, DBMS v/s Data Mining , DM techniques, Mining problems, Issues and Challenges in DM, DM Application areas.

Reference Books:

1. Charles P. Pleege, “Security in Computing”, Pearson Education Asia, 5th Edition, 2001.
2. William Stallings, “Network Security Essentials: Applications and standards”, Person Education Asia, 2000
3. Dan W. Patterson: Introduction to Artificial Intelligence and Expert System, Prentice Hall.
4. Adrian McEwen, Hakim Cassimally, “Designing the Internet of Thing”, Wiley
5. 2. Rajkamal, “Internet of Things: Architecture and Design Principles”, McGraw Hill Educ
6. Data Mining Techniques ; ArunK.Pujari ; University Press.

II- SEMESTER

PAPER-I: HTML

UNIT-1:

Concepts of Hypertext, HTML introduction, features, uses & versions Using various HTML tags, Elements of HTML syntax, Head & Body Sections, inserting texts, Text alignment, using images in pages.

UNIT-2:

HTML: Hyperlinks text and images, bookmarks, Backgrounds and Color controls, creating and using Tables in HTML, and presentation, use of font size & Attributes, List types and its tags.

UNIT-3:

CSS: Cascading Style sheets defining and using simple CSS.

UNIT-4:

Overview of MS FrontPage, Macromedia Dream weaver, and other popular HTML editors, designing Web sites using HTML editors. Use of Frames and Forms in web pages, Image editors, Issues in Web site creations & Maintenance.

UNIT-5:

Web Hosting and publishing Concepts, Hosting considerations, Choosing Domain names, Domain name Registration, Obtaining space on Server for Web site, FTP software for upload web site. Add your website on search engines.

Reference Books:

1. Learn HTML in a weekEnd by Steven E. Callihan, PHI
2. Using HTML By Lee Anne Phillips, PHI
3. SAMS Teach Yourself JavaScript in 24 Hrs., By Michael Moncur. Tech Media

PAPER-II: JavaScript

UNIT-1:

JavaScript Overview, JavaScript and the WWW JavaScript vs. VB Script, JavaScript vs. Java, JavaScript versions, Script element,.

UNIT-2:

Functions: Functions introduction, Calling functions. JavaScript Comments, Variables: Variables overview, declaring variables, Types of variables, Casting variables, Alert box, Prompt & confirm.

UNIT-3:

JavaScript in Expressions: Arithmetic operators, Assignment operators, Logical operators, Expressions and precedence,

UNIT-4:

Statements: If statement, for statement, while statement, Break/Continue.

UNIT-5:

Creating arrays/event handlers, JavaScript Object model, Object and Events in JavaScript – OnClick On Mouse Over, On Focus, OnChange, On Load etc. Getting data with forms.

Reference Books:

1. Learn HTML in a weekEnd by Steven E. Callihan, PHI
2. Using HTML By Lee Anne Phillips, PHI
3. SAMS Teach Yourself JavaScript in 24 Hrs., By Michael Moncur. Tech Media

PAPER-IV: SQL

UNIT-1:

Structured Query Language : Writing Basic SQL Select Statements, Restricting and Sorting Data, Single-Row Functions, Joins (Displaying Data from Multiple Tables), Aggregating Data using Group Functions, Sub-queries, Manipulating Data.

UNIT-2:

Creating and Managing Tables, Including Constraints, Creating Views, Creating other Database Objects (Sequences, Indexes and Synonyms)

UNIT-3:

Advanced SQL : Controlling user Access, using SET operators, Data Time Functions, Enhancements to Group by clause (cube, Rollup and Grouping).

UNIT-4:

Advanced Sub-queries (Multiple column Sub-queries, Sub-queries in FROM clause, Scalar and correlated Sub queries), WITH Clause, Hierarchical retrieval.

UNIT-5:

PLSQL : Introduction, Overview and benefits of PL/SQL, Subprograms, types of PL/SQL blocks, Simple Anonymous Block, Identifiers, types of identifiers, Declarative Section, variables, Scalar Data Types, The % Type attribute, bind variables.

REFERENCES:

1. Web Design The complete Reference, Thomas Powell, Tata McGrawHill
2. HTML and XHTML The complete Reference, Thomas Powell, Tata McGrawHill
3. JavaScript 2.0 : The Complete Reference, Second Edition by Thomas Powell and Fritz Schneider
4. PHP : The Complete Reference By Steven Holzner, Tata McGrawHill

PAPER-IV: DBMS

UNIT-1:

DBMS Concepts and architecture Introduction, Database approach v/s Traditional file accessing approach, Advantages, of database systems, Data models, Schemas and instances, Data independence, Data Base Language and interfaces, Overall Database Structure, Functions of DBA and designer.

UNIT-2:

ER data model : Entities and attributes, Entity types, Defining the E-R diagram ,Concept of Generalization, Aggregation and Specialization. Various other data models object oriented data Model, Network data model, and Relational data model.

UNIT-3:

Relational Data models: Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints. Referential integrity, Intension and Extension.

UNIT-4:

Relational Query languages: SQL-DDL, DML, integrity constraints, Complex queries, various joins, indexing, Relational algebra and relational calculus, Relational algebra operations like select, Project Join, Division, outer union. Types of relational calculus .

UNIT-5:

Data Base Design: Introduction to normalization, Normal forms, Functional dependency, Decomposition, Dependency preservation and lossless join, problems with null valued and dangling tuples, multivalued dependencies.

References:

1. Date C J, “An Introduction To Database System”, Pearson Educations
2. Korth, Silbertz, Sudarshan, “Fundamentals of Database System”, McGraw Hill
3. Rob, “ Data Base System: Design Implementation & Management”, Cengage Learning
4. Elmasri, Navathe, “Fundamentals Of Database Systems”, Pearson Educations
- 5 . Atul Kahate , “ Introduction to Database Management System”, Pearson Educations

PAPER- V: PYTHON PROGRAMMING LANGUAGE

UNIT 1:

Introduction: check icon History, Features, Setting up path, Variable and Data Types, Operator.

Conditional Statements: if, if-else, if-elif, nested if-else and Looping: for, while, nested loops with break, continue and pass keyword.

UNIT 2:

String Manipulation: Accessing Strings, Basic Operations, String slices, Function and Methods. **Functions:** Defining and Calling of a function, Types of functions, Function Arguments.

UNIT 3:

Modules: Importing module, Math module, Random module, os module, date-time module, calendar module, Packages.

UNIT 4:

IO:Printing on screen and Reading data from keyboard, Opening and closing file, Reading and writing files, Functions.

UNIT 5:

Exception Handling: Except, Try, else, finally clause, User Defined Exceptions.

OOPs concept: Class and object, Attributes, Inheritance, Overloading, Overriding, Data hiding, final and abstract class.

References:

1. Programming and Problem Solving with Python (Ashok Namdev Kamthane and Amit Ashok Kamthane) McGraw Hill publication
2. Let Us Python (Kanetkar Yashavant) BPB Publication
3. Python Complete Reference (Brown Martin C.) McGraw Hill publication
4. Python Programming A Modular Approach (Naveen and Kumar and Taneja Sheetal) PEARSON
5. Beginning Django (Rubio Daniel) Apress