

**OUTLINES OF TESTS,
SYLLABI AND COURSES OF READINGS
CREDIT BASED SYSTEM**

**For
Post Graduate Diploma in Computer
Applications**

PGDCA

PGDCA (I & II Semester)

Session 2023-24

**MATA GUJRI COLLEGE
SRI FATEHGARH SAHIB-140406**

SYLLABUS
OUTLINE OF PAPER AND TESTS
PGDCA (Post Graduate Diploma in Computer Applications)
FIRST YEAR-(FIRST SEMESTER EXAMINATIONS)
Session 2023-24

Code	Title of Paper	Schedule of Teaching (Hours/Week)			Total Hours	Credits	Marks	
		L	T	P			External	Internal
PGDCA-101	Introduction to Information Technology	4	0	0	4	4	70	30
PGDCA-102	Programming with Python	4	0	0	4	4	70	30
PGDCA-103	Operating System	4	0	0	4	4	70	30
PGDCA-104	Software Lab – I Office Automation and Productivity Tools	0	0	6	6	3	70	30
PGDCA-105	Software Lab – II based On PGDCA-102	0	0	6	6	3	70	30
Total		12	0	12	24	18	350	150

- i. The breakup of marks for the Continuous assessment for theory papers will be as under:

i.	One or two tests out of which minimum one best will be considered for assessment (50% of Total marks)	15 Marks
i.	Attendance (20% of Total marks)	6 Marks
ii.	Class participation and behaviour (30% of Total marks)	9 Marks

- i. The breakup of for the Continuous Assessment for the practical will be as under:

	Lab Assignments (20 % of Total marks)	6 Marks
	Viva (50 % of Total marks)	15 Marks
	Attendance/Class participation and behaviour (30 % of Total marks)	9 Marks

PGDCA-101 Introduction to Information Technology

Maximum Marks: 100
Internal Assessment: 30
External Examination: 70
Minimum Pass Marks: 35%

Maximum Time: 3HRS
Lectures to be delivered: 45-55

Course Objective: The objective of this paper is to familiarize the students with concept of IT basics, computer applications, programming, interactive media, Internet basics etc.

Course Outcomes: After the completion of this course, the students will be able:

CO1: To understand the basics of computer system, its architecture, database and Networks.

CO2: To understand the basic concepts, terminology of IT and familiar with the use of IT tools.

A) Instructions for paper-setters

The question paper will consist of three units I, II and III. Unit I and II will have four questions from the respective units of the syllabus carrying 20% marks each. Unit III will have 5-10 short answer type questions which cover the entire syllabus uniformly carrying 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from Unit I and II. Unit III is compulsory.
2. Use of non-programmable scientific calculator is allowed.

UNIT-I

Computer Fundamentals: Block structure of a computer, characteristics of computers, generations of computers, classification of computers on the basis of size and logic. **Number System:** Bit, byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other, **Binary Arithmetic:** Addition, subtraction and multiplication. **Representation of Information:** Integer and floating point representation, Complement schemes, Character codes (ASCII, EBCDIC, BCD, 8421, 2421, Excess-3, Gray, Hamming) **Memory types:** Magnetic core, RAM, ROM, Secondary, Cache, Bubble Memory. **I/O devices:** Light pen, joystick, Mouse, Touch screen; OCR, OMR, MICR. **Printers:** Impact, non-impact. **Storage devices:** floppy disk, hard disk, compact disk, tape.

UNIT-II

Computer languages: Machine language, assembly language, higher level language, 4GL. **Introduction to:** Compiler, Interpreter, Assembler, System Software and Application Software. **Operating System:** classification—simple batch processing, Multiprogramming, Multitasking, parallel Systems, Distributed system, Real time system. **Computer Network and Communication:** Network types, network topologies, network communication devices, physical communication media. **Internet and its Applications:** E-mail, TELNET, FTP, World Wide Web, Internet chatting; Intranet, extranet. **Computer Network and Communication:** Network types, network topologies, network communication devices, physical communication media. **Internet and its Applications:** E-mail, TELNET, FTP, World Wide Web, Internet chatting; Intranet, extranet.

Text Book:

1. Foundations of Computing by P.K. Sinha and P. Sinha, BPB First Edition.

References:

1. Information Technology and Management by Turban Mclean and Wetbrete, John Wiley & Sons.
2. Information Technology by Satish Jain, BPB.

Teaching Plan

Week-I	Computer Fundamentals: Block structure of a computer, characteristics of computers, generations of computers
Week-II	Classification of computers on the basis of size and logic.
Week –III	Number System: Bit, byte, binary, decimal, hexadecimal, and octal systems conversion from one system to the other
Week-IV	Binary Arithmetic: Addition, subtraction and multiplication.
Week –V	Representation of Information: Integer and floating point representation, Complement schemes, Character codes (ASCII, EBCDIC)
Week-VI	Character codes (8421, 2421, Excess-3, Gray, Hamming)
Week –VII	Memory types: Magnetic core, RAM, ROM, Secondary, Cache, Bubble Memory
Week-VIII	I/O devices: Light pen, joystick, Mouse, Touch screen; OCR, OMR, MICR.
Week –IX	Printers: Impact, non-impact. Storage devices: floppy disk, hard disk, compact disk, tape
Week –X	Computer languages: Machine language, assembly language, higher level language, 4GL.
Week –XI	Operating System: classification–simple batch processing, Multiprogramming, Multitasking, parallel Systems, Distributed system, Real time system, physical communication media.
Week –XII	Internet and its Applications: E-mail, TELNET, FTP, World Wide Web, Internet chatting; Intranet, extranet.

PGDCA-102 Programming with Python

Maximum Marks: 100
Internal Assessment: 30
External Examination: 70
Minimum Pass Marks: 35%

Maximum Time: 3HRS
Lectures to be delivered: 45-55

Course Objective: The objective of this course is to enable students to learn a new programming language which has high demand in industry. Students are expected to use Dictionary, Functions in effective manner in order to create a reliable and user friendly application.

Course Outcomes

CO1: To provide Basic knowledge of Python and to understand why Python is a useful scripting language for developers.

CO2: To learn how to design and program Python applications.

A) Instructions for paper-setters

The question paper will consist of three units I, II and III. Unit I and II will have four questions from the respective units of the syllabus carrying 20% marks each. Unit III will have 5-10 short answer type questions which cover the entire syllabus uniformly carrying 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from Unit I and II. Unit III is compulsory.
2. Use of non-programmable scientific calculator is allowed.

UNIT-I

Introduction to Python: Python Interpreter, Using Python as calculator, Python shell, Python IDLE, Indentation, Atoms, Identifiers and keywords, Literals.

Operators: Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment and Decrement operator

Creating Python Programs: Input and Output Statements, Control statements (Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass).

Strings and Lists: String as a compound data type, Length, Traversal and the for loop, String slices, String comparison, A find function, Looping and counting, List values, Accessing elements, List length, List membership, Lists and for loops, List operations, List deletion. Cloning lists, Nested lists.

UNIT-II

Tuples and Dictionary: Update and delete tuples, basic tuples operation, indexing and slicing tuples, Update and delete dictionary, properties of dictionary keys.

Functions: arguments, parameter pass by reference, default arguments, variable length arguments, return argument, scope of variables, Recursion, Stack diagrams for recursive functions, Anonymous function.

File handling: Introduction, Reading and writing text files.

Object Oriented Programming: Introduction to Classes, Objects and Methods, Standard Libraries.

Exceptions: Handling an exception, except Clause, try-finally Clause, Raising an Exceptions

References :

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. How to think like a computer scientist : learning with Python / Allen Downey, Jeffrey Elkner, Chris Meyers. 1st Edition – Freely available online.

Teaching Plan

Week-I	Introduction to Python: Python Interpreter, Using Python as calculator, Python shell, Python IDLE.
Week-II	Indentation, Atoms, Identifiers and keywords, Literals.
Week-III	Operators: Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment and Decrement operator
Week-IV	Creating Python Programs: Input and Output Statements, Control statements (Branching, Looping)
Week-V	Conditional Statement, Exit function, Difference between break, continue and pass.
Week-VI	Strings and Lists: String as a compound data type, Length, Traversal and the for loop, String slices, String comparison,
Week-VII	A find function, Looping and counting, List values, Accessing elements, List length, List membership, Lists and for loops, List operations, List deletion. Cloning lists, Nested lists.
Week-VIII	Tuples and Dictionary: Update and delete tuples, basic tuples operation, indexing and slicing tuples, Update and delete dictionary, properties of dictionary keys.
Week-IX	Functions: arguments, parameter pass by reference, default arguments, variable length arguments, return argument, scope of variables, Recursion, Stack diagrams for recursive functions, Anonymous function
Week-X	File handling: Introduction, Reading and writing text files. Object Oriented Programming: Introduction to Classes, Objects and Methods, Standard Libraries.
Week-XI	Exceptions: Handling an exception, except Clause, try-finally Clause, Raising an Exceptions
Week-XII	Revision of Syllabus

PGDCA-103 OPERATING SYSTEM

Maximum Marks: 100
Internal Assessment: 30
External Examination: 70
Minimum Pass Marks: 35%

Maximum Time: 3HRS
Lectures to be delivered: 45-55

Course Objective: The objective of this paper is to familiarize the students with concept of Operating Systems & their functions and the need for special purpose operating system with the advent of new emerging technologies.

Course Outcomes: On completion of this course, the student will be able to:

CO1: Describe basic functions of an Operating System.

CO2: Describe different techniques for managing computer resources like CPU, memory, file and devices.

CO3: Implement simple algorithms for managing computer resources

A) Instructions for paper-setters

The question paper will consist of three units I, II and III. Unit I and II will have four questions from the respective units of the syllabus carrying 20% marks each. Unit III will have 5-10 short answer type questions which cover the entire syllabus uniformly carrying 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from Unit I and II. Unit III compulsory.
2. Use of non programmable scientific calculator is allowed

Unit-I

Introduction to Operating System: Definition, Types of Operating system, Operating system components, Operating system services. **Process Management:** Process concept, Process cs. threads, CPU scheduling criteria, Scheduling algorithms, and Algorithm evaluation **Deadlocks:** Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, avoidance, detection and recovery. **File Management:** File concept, Access methods, directory structure, Allocation methods – contiguous, linked and indexed.

Unit-II

Memory Management: Background, logical vs. physical address space, Contiguous memory management schemes using Multi partition memory allocation using fixed number of tasks and variable number of tasks, paging and segmentation. **Virtual Memory management:** Concept, demand paging and demand segmentation. **Mass storage structure:** Disk structure, disk scheduling algorithms. **Protection:** Goals of protection, Access matrix. **Security:** Security problem, Program threats, system threats, User Authentication, Cryptography.

Text Book:

1. Silberschatz and Galvin, "Operating System Concepts", Addison-Wesley publishing.

Reference Books:

- 1 Nutt Gary, "Operating Systems" Addison Wesley Publication.
- 2 Hansen, Per Brinch, "Operating System Principles", Prentice-Hall.
- 3 N. Haberman, "Introduction to Operating System Design", Galgotia Publications.
- 4 Hansen, Per Brinch, "The Architecture of Concurrent Programs", PHI.
- 5 Shaw, "Logical Design of Operating System", PHI.

Teaching Plan

Week-I	Introduction to Operating System: Definition, Types of Operating system, Operating system components, Operating system services.
Week-II	Process Management: Process concept, Threads,
Week –III	CPU scheduling criteria, Scheduling algorithms, and Algorithm evaluation
Week-IV	Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, avoidance, detection and recovery.
Week –V	File Management: File concept, Access methods, directory structure, Allocation methods – contiguous, linked and indexed.
Week-VI	Memory Management: Background, logical vs. physical address space,
Week –VII	Contiguous memory management schemes using Multi partition memory allocation using fixed number of tasks and variable number of tasks,
Week-VIII	paging and segmentation.
Week –IX	Virtual Memory management: Concept, demand paging and demand segmentation.
Week –X	Disk structure, disk scheduling algorithms. Protection: Goals of protection, Access matrix.
Week –XI	Security: Security problem, Program threats, system threats, User Authentication, Cryptography.

PGDCA-104 Software Lab-I (Office Automation and Productivity Tools)

Maximum Marks: 100

Maximum Time: 3HRS

Minimum Pass Marks: 35%

Lectures to be delivered: 45-55

Objectives of the course: This course trains students how to use Office automation tools (open source/ proprietary) applications to carry out work such as creating professional-quality documents; store, organize and analyses information; arithmetic operations and functions; and create slide presentations with animation, narration, images, videos, and much more, digitally and effectively.

This laboratory course will comprise as exercises based on Office Automation and Productivity Tools. Students are required to practice following

Word Processor: Introduction to Word Processing, Interface, Toolbars, Ruler, Menus, Keyboard Shortcut, Editing a Document, Previewing documents, Printing documents, Formatting Documents, Checking the grammar and spelling, Formatting via find and replace, Using the Thesaurus, Using Auto Correct, Auto Complete and Auto Text, word count, Hyphenating, Mail merge, mailing Labels Wizards and Templates, Handling Graphics, Drawings, tables and charts, Converting a word document into various formats.

Presentation Tools: Creating slides, Applying transitions and sound effects, setting up slide shows, Animation. Adding Graphics: Inserting Pictures, tables, movies etc. Effects to Presentation: Setting Animation and Transition Effects, Adding Audio and Video.

Spreadsheet: Creating worksheet, entering data into worksheet, heading information, data, text, dates, alphanumeric, values, saving & quitting worksheet, Opening and moving around in an existing worksheet, Toolbars and Menus, keyboard shortcuts, Working with single and multiple workbook, Formatting of worksheet, Working with formulas, Inserting & deleting of data ,cell, row or column, Mathematical operations, cell referencing, Spread Sheet referencing, Creating Charts

Maximum Marks for Continuous assessment:30

Maximum Marks for Semester examination: 70

The breakup of marks for the Semester examination will be as under:

i	Lab Record	20
ii	Viva Voce	30
iii	Task given in the examination/Program Development and Execution	20

Textbooks:

- Office Automation Concepts and Tools by Dionysios C. Tschritzis, Springer.

Reference Books:

- Automation, Production Systems, and Computer-Integrated Manufacturing by Mikell P. Groover, Pearson, Global Edition.
- The Handbook of Office Automation by Ralph Tomas.
- Microsoft Office Access 2007 VBA by Scott B. Diamond, Pears

PGDCA-105 Software Lab-II
(based on PGDCA-102)

Maximum Marks: 100

Minimum Pass Marks: 35%

Lectures to be delivered: 45-55

This laboratory course will comprise as exercises to supplement what is learnt under paper PGDCA-102: Programming with Python

Maximum Marks for Continuous assessment:30

Maximum Marks for Semester examination: 70

The breakup of marks for the Semester examination will be as under:

i	Lab Record	20
ii	Viva Voce	30
iii	Task given in the examination/Program Development and Execution	20

SYLLABUS
SYLLABUS, OUTLINES OF PAPERS AND TESTS
OUTLINE OF PAPER AND TESTS
PGDCA (Post Graduate Diploma in Computer Applications)
SYLLABUS
FIRST YEAR-(SECOND SEMESTER EXAMINATIONS)
Session 2023-24

Code	Title of Paper	Schedule of Teaching (Hours/Week)			Total Hours	Credits	Marks	
		L	T	P			External	Internal
PGDCA-201	Fundamentals of Computer Network, Internet and Scripting Languages	4	0	0	4	4	70	30
PGDCA-202	Object Oriented Programming Using C++	4	0	0	4	4	70	30
PGDCA-203	Data Base Management System	3	0	2	5	4	70	30
PGDCA-204	Software Lab-III based on PGDCA-201	0	0	6	6	3	70	30
PGDCA-205	Software Lab - IV based on PGDCA-202	0	0	6	6	3	70	30
	TOTAL	11	0	14	25	18	350	150

i. The breakup of marks for the Continuous assessment for theory papers will be as under:

iii.	One or two tests out of which minimum one best will be considered for assessment (50% of Total marks)	15 Marks
iv.	Attendance (20% of Total marks)	6 Marks
v.	Class participation and behaviour (30% of Total marks)	9 Marks

ii. The breakup of for the Continuous Assessment for the practical will be as under:

	Lab Assignments (20 % of Total marks)	6 Marks
	Viva (50 % of Total marks)	15 Marks
	Attendance/Class participation and behaviour (30 % of Total marks)	9 Marks

PGDCA-201 Fundamentals of Computer Network, Internet and Scripting Languages**Maximum Marks: 70****Minimum Pass Marks: 35%****Time allowed: 3 Hrs.****Lectures to be delivered: 45-55**

Course Objective: The objective of this course is to Students will try to learn the basic taxonomy and terminology of the computer networking and gain core knowledge of Network layer routing protocols. Understand how to use HTML tags and tag attributes to control a Web page's appearance.

Course Outcomes: On completion of this course, the student will be able to:

CO1: apply data communication techniques in real-life experiments like telemetry and also develop some basic skills to modify the existing ones to better suit them in different situations.

CO2: develop expertise and skills to apply services of various types of computer networks in various technical and professional fields.

CO3: Students are able to develop a dynamic webpage by the use of HTML

A) Instructions for paper-setters

The question paper will consist of three units I, II and III. Unit I and II will have four questions from the respective units of the syllabus carrying 20% marks each. Unit III will have 5-10 short answer type questions which cover the entire syllabus uniformly carrying 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from Unit I and II. Unit III is compulsory.
2. Use of non-programmable scientific calculator is allowed.

Unit -I

Computer Networks: Introduction, Applications, Network hardware and Software (protocol hierarchies, design issues for layers, interfaces and services: connection oriented and connection less), Network structure and architecture- point to point, multicast, broadcast, Classification of networks- LAN, MAN and WAN. Reference models - the OSI reference model, TCP / IP reference model. Comparison between OSI and TCP / IP models.

Internet: Introduction, Relays, Repeaters, Bridges, Routers, Gateways.

Internet Working: How networks differ, concatenated virtual circuits, connectionless internetworking, tunneling, internetwork Routing, fragmentation, Firewalls, internet architecture.

Unit-II

Scripting languages: HTML: Introduction to HTML, HTML and the World Wide Web, HTML elements, basic structure elements of HTML, the two categories of body elements – block level and text level, creating HTML pages, viewing pages in different browsers, rule for nesting HTML tags, colors and fonts, formatting the body section, creating links, creating external links, creating internal links.

Text Book:

1. Computer Networks by Andrew S. Tanenbaum, PHI Publications, Third Edition 1997.
2. Rick Dranell ,HTML 4.0 Unleashed , 2nd Edition ,Tech Media Publications

References:

1. Computer Networks and Internets by Douglas E. Comer, Addison Wesley, 2nd Edition.
2. Data Networks by D. Bertsekas and R. Gallager, Prentice Hall, 2nd Edition.
3. Introduction to data communication and networking by [Behrouz A. Forouzan](#), McGraw-Hill Higher education, 5th edition.
4. [Elizabeth Castro](#), HTML and CSS: Visual QuickStart Guide 8th Edition.

Teaching Plan

Week-I	Computer Networks: Introduction, Applications, Network hardware and Software (protocol hierarchies, design issues for layers, interfaces and services: connection oriented and connection less),
Week-II	Network structure and architecture- point to point, multicast, broadcast, Classification of networks-LAN, MAN and WAN.
Week -III	Reference models - the OSI reference model, TCP / IP reference model.
Week-IV	Comparison between OSI and TCP / IP models.
Week –V	Internet: Introduction, Relays, Repeaters, Bridges, Routers, Gateways.
Week-VI	Internet Working: How networks differ, concatenated virtual circuits, connectionless internetworking, tunneling, internetwork Routing, fragmentation, Firewalls, internet architecture.
Week -VII	Scripting languages: HTML: Introduction to HTML, HTML and the World Wide Web, HTML
Week-VIII	basic structure elements of HTML, the two categories of body elements – block level and text level, creating HTML pages, viewing pages in different browsers, rule for nesting.
Week -IX	colors and fonts, formatting the body section,
Week –X	Creating links, creating external links, creating internal links.

PGDCA-202 Object Oriented programming Using C++

Maximum Marks: 100

Internal Assessment: 30

External Examination: 70

Minimum Pass Marks: 35%

Maximum Time: 3HRS

Lectures to be delivered: 45-55

Course Objective: The objective of this course is to understand how C++ improves C with object-oriented features and understand the concept of data abstraction and encapsulation.

Course Outcomes: On completion of this course, the student will be able to:

CO1: Understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism.

CO2: Understand advanced features of C++ specifically stream I/O, templates and operator overloading

A) Instructions for paper-setters

The question paper will consist of three units I, II and III. Unit I and II will have four questions from the respective units of the syllabus carrying 20% marks each. Unit III will have 5-10 short answer type questions which cover the entire syllabus uniformly carrying 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from Unit I and II. Unit III is compulsory.

2. Use of non-programmable scientific calculator is allowed.

Unit-I

Evolution of OOP: Procedure Oriented Programming, OOP Paradigm, Advantages and disadvantages of OOP over its predecessor paradigms. **Characteristics of Object Oriented Programming:** Abstraction, Encapsulation, Data hiding, Inheritance, Polymorphism, Code Extensibility and Reusability, User defined Data Types. **Introduction to C++:** Identifier, Keywords, Constants, variables, expressions, manipulators. **Operators:** Arithmetic, relational, logical, conditional and assignment. Input and output statements, stream I/O, Conditional and Iterative statements, breaking control statements. **Storage Classes:** Automatic, Static, Extern, Register. **Arrays:** Arrays as Character Strings, Structures, Unions. **Pointers:** Pointer Operations Pointer Arithmetic, **Functions:** Prototyping, Definition and Call, Parameter Passing: by value, by address and by reference, recursion, function overloading.

Unit-II

Classes and Objects: Class Declaration and Class Definition, Defining member functions, making functions inline, nesting of member functions, friend functions and friend classes. **Constructors:** properties, types of constructors (Default, parameterized and copy), **Destructors:** properties, Rules for constructors and destructors. Dynamic memory allocation using new and delete operators. **Inheritance:** types of inheritance: Single, Multiple, Multilevel and Hybrid. **Polymorphism:** Methods of achieving polymorphic behaviour, **Operator overloading:** overloading binary operator, overloading unary operators, rules for operator overloading, Function overloading: early binding, late binding. **Files and streams:** Classes for file stream operations, opening and closing of files, stream state member functions, binary file operations, structures and file operations, classes and file operations.

Text Book:

1. The Complete Reference C++ by Herbert Schildt, Tata McGraw-Hill.

References:

1. C++ How to Program by Deitel and Deitel, , Pearson Education.
2. Object Oriented Programming in C++ by Robert Lafore, Galgotia Publications.

3. The C++ Programming Language by Bjarne Strastrup, Addison-Wesley Publication Co.
4. C++ Primer by Stanley B. Lippman, Josee Lajoie, Pearson Education.
5. Object Oriented Programming with C++ by E. Balagurusamy, Tata McGraw-Hill.

Teaching Plan

Week-I	Evolution of OOP: Procedure Oriented Programming, OOP Paradigm, Advantages and disadvantages of OOP over its predecessor paradigms. Characteristics of Object Oriented Programming: Abstraction, Encapsulation, Data hiding, Inheritance, Polymorphism, Code Extensibility and Reusability, User defined Data Types.
Week-II	Introduction to C++: Identifier, Keywords, Constants, variables, expressions, manipulators.
Week -III	Operators: Arithmetic, relational, logical, conditional and assignment. Input and output statements, stream I/O, Conditional and Iterative statements, breaking control statements.
Week-IV	Storage Classes: Automatic, Static, Extern, Register. Arrays: Arrays as Character Strings, Structures, Unions.
Week -V	Pointers: Pointer Operations Pointer Arithmetic,
Week-VI	Functions: Prototyping, Definition and Call, Parameter Passing: by value, by address and by reference, recursion, function overloading.
Week -VII	Classes and Objects: Class Declaration and Class Definition, Defining member functions, making functions inline, nesting of member functions, friend functions and friend class
Week-VIII	Constructors: properties, types of constructors (Default, parameterized and copy),
Week -IX	Destructors: properties, Rules for constructors and destructors. Dynamic memory allocation using new and delete operators.
Week -X	Inheritance: types of inheritance: Single, Multiple, Multilevel and Hybrid.
Week -XI	Polymorphism: Methods of achieving polymorphic behaviour, Operator overloading: overloading binary operator, overloading unary operators, rules for operator overloading, Function overloading: early binding, late binding.
Week-XII	Files and streams: Classes for file stream operations, opening and closing of files, stream state member functions, binary file operations, structures and file operations, classes and file operations.

PGDCA- 203 Database Management System

Maximum Marks: 100

Internal Assessment: 30

External Examination: 70

Maximum Time: 3HRS

Lectures to be delivered: 45-55

Course Objectives : The objective of this course is to expose the students to the fundamentals & basic concepts in Data Base Management Systems. This course explains techniques for database design, database recovery and protection.

Course Outcomes: On completion of this course, the student will be able to:

CO1:Demonstrate an understanding of the elementary & advanced features of DBMS.

CO2:Describe DBMS architecture, physical and logical database designs, database modeling, relational, hierarchical and network models.

A) Instructions for paper-setters

The question paper will consist of three units I, II and III. Unit I and II will have four questions from the respective units of the syllabus carrying 20% marks each. Unit III will have 5-10 short answer type questions which cover the entire syllabus uniformly carrying 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from Unit I and II. Unit III is compulsory.
- 2..Use of non -programmable scientific calculator is allowed.

Unit-I

Traditional file processing system: Characteristics, limitations, Database: Definition,composition.

Database Management System: Definition, Characteristics, advantages over traditional fileprocessing system, Users of database, DBA and its responsibilities, Database schema, instance. DBMS architecture, data independence, mapping between different levels.

Database languages: DDL, DML, DCL.

Database utilities, Data Models, Keys: Super, candidate, primary, unique, foreign.

Entity relationship model: concepts, mapping cardinalities, entity relationship diagram,weak entity sets, strong entity set, aggregation, generalization, converting ER diagrams to tables. Overview of Network and Hierarchical model.

Relational Data Model: Concepts, Constraints: Entity, Referential and Domain Integrity, Relational algebra: Basic operations, additional operations.

Unit-II

Database Design: Functional dependency, composition, problems arising out of bad database design, normalization, multi-valued dependency, Database design process, data base protection, database integrity.

Database concurrency: Definition and problems arising out of concurrency.

Database security: Authentication, authorization, methods of implementing security.

Query Based: Working with database and tables, queries in Access, Applying integrity constraints, Introduction to forms, sorting and filtering controls, Reports and Macro: creating reports, using Macros.

Text Book:

1. Database Management system by B.P. Desai, BPB publications, New Delhi.
2. Introduction to database System by Elmisry Nawathy, Pearson Education India.

References:

1. An Introduction to Data Base Systems by C.J. Date, 3rd Ed., Narosa Publishers.
2. Principles of Database Systems by Jeffrey D. Ullman, 2nd Ed., Galgotia Pub.
3. Database Processing by D. Kroenke, Galgotia Publications.
4. Database System Concepts by Henry F. Korth, McGraw Hill. Inc.

5. Introduction to Database Management by Naveen Prakash, TMH.

Teaching Plan

Week-I	Traditional file processing system: characteristics, limitations. Database: definition.
Week-II	DBMS: definition, characteristics, advantages, database schema, instance, DBA and its responsibilities,
Week -III	three level architecture of DBMS, mapping between different levels, Data independence.
Week-IV	Database languages: DML, DCL, DDL Keys: primary, candidate, super, foreign, composite.
Week -V	E-R MODEL: Definition, Entity and Relationship, cardinality of a relationship, E-R Diagram Notations, Modeling using E-R Diagrams, weak entity sets, strong entity sets, converting E-R diagrams to tables. Aggregation, Generalization, Specialization.
Week-VI	Data Base Model: Hierarchical, Network, Relational Models & their difference.
Week -VII	Normalization: Definition, Need, Functional Dependency, Full Functional Dependency, Partial Dependency, Transitive dependency, Multivalued Dependency, Types of Normal Forms:(1NF,2NF,3NF,BCNF).
Week-VIII	Database concurrency: definition, Problems of concurrency: Lost Update, Dirty read, Incorrect Summary.
Week -IX	Concurrency control techniques: Locking, Deadlock.
Week -X	Introduction to Database Recovery: Transaction Log: Deferred Update
Week -XI	Introduction to Database Security: Privileges, Granting and Revoking Privileges and roles
Week-XII	Revision

PGDCA-204 Software Lab – III based on PGDCA-201

Maximum Marks: 100

Minimum Pass Marks: 35%

Lectures to be delivered: 45-55

Course Objective: Understand how to use HTML tags and tag attributes to control a Web page's appearance. Students are able to develop a dynamic webpage by the use of HTML

This laboratory course will comprise as exercises to supplement what is learnt under paper PGDCA-202: Introduction to Computer Network, Internet and E-Commerce and Students are required to practices

HTML: Tables, Forms and other text formatting tags

*Maximum Marks for Continuous assessment : 30

Maximum Marks for Semester examination : 70

The breakup of marks for the Semester examination will be as under

- | | | |
|-------------|--|-----------------|
| i. | Lab Record / | 20 Marks |
| ii. | Viva Voce | 30 Marks |
| iii. | Task given in the examination/Program Development and Execution | 20 Marks |

PGDCA- 205 Software Lab – IV based on PGDCA-202**Maximum Marks: 100****Minimum Pass Marks: 35%****Lectures to be delivered: 45-55**

Objectives of the course: Understand fundamentals of object-oriented programming in C++, including defining classes, invoking methods, using class libraries, etc., have the ability to write a computer program to solve specified problems, knowledge of object-oriented paradigm in C++ programming language.

Suggestive Exercises:

Student must cover the programs on features of C++, C++ IDE, Identifiers and Keywords, Data Types in C++ , C++ coding conventions, Expressions in C++, Control structures, decision making statements, Arrays and its methods, Introduction to object and Classes, Exception Handling Concepts.

Programs:

- 1) Write a Program to check whether a number is even or odd.
- 2) Write a Program to demonstrate scope and lifetime of variables.
- 3) Write a Program to implement the concept of ternary operator.

FUNCTIONS

- 4) Write a Program to implement the concept of recursive function and arrays.
- 5) Write a Program to implement the concept of constructor.
- 6) Write a Program to demonstrate the concept of method overloading.
- 7) Write a Program to implement nesting of methods.
- 8) Write a Program to implement the concept of destructor

STRINGS

- 9) Write a Program to implement the concept of abstract class.
- 10) Write a Program to implement the concept of string methods.

INHERITANCE

- 11) Write a Program to implement the concept of hierarchical inheritance.
- 12) Write a Program to implement the concept of multilevel inheritances.
- 13) Write a Program to define an interface.
- 14) Write a Program to define final class.
- 15) Write a Program to implement template.

EXCEPTION HANDLING

- 16) Write a Program to show the usage of exception handling.
- 17) Write a Program to show the usage of try and catch block.
- 18) Write a Program to demonstrate inner class.

*Maximum Marks for Continuous assessment : 30

Maximum Marks for Semester examination : 70

The breakup of marks for the Semester examination will be as under

i.	Lab Record /	20 Marks
ii.	Viva Voce	30 Marks
iii.	Task given in the examination/Program Development and Execution	20 Marks