Examination Scheme and Syllabus

for

Post Graduate Diploma in Computer Applications (PGDCA)

w.e.f. 2021-22

(Choice Based Credit System)

CH. BANSI LAL UNIVERSITY

BHIWANI

Chaudhary Bansi Lal University, Bhiwani

(Established under Govt of Haryana Act No 25 of 2014)

Study & Evaluation Scheme
of
PGDCA

Summary

- **Programme: Post Graduate Diploma in Computer Applications (PGDCA)**
- **Eligibility: Graduation with 50% marks**
- **Duration: One Year full time (Two Semesters)**
- **Medium: English**
- **Minimum Required Attendance: 75%**
- **Total Credits: 47**

Assessment/ Evaluation

Internal Marks	External Marks	Total Marks
20	80	100

Internal Evaluation

Minor Test will be held as per Ordinance of Choice Based Credit System for PG Courses.

Minor Test	Attendance	Assignment(s)
10	05	05

Duration of Examination

External	Minor Test (Internal)
3 hrs	$1^1/_2$hr

To qualify the course, a student is required to secure a minimum of 40% marks in aggregate including the end semester examination and internal evaluation (i.e. both internal and external). A candidate who secures less than 40% of marks in a course shall be deemed to have failed in that course. The student should have at least 40% marks in aggregate to clear the semester.

Hobby Club

Students should be involved in extracurricular activities through Hobbies Club (Non-credit) such as Poetry, Science, Club, Drama etc. and will be awarded a letter grade at the competition of Diploma. The criteria for evaluation and distribution of marks of Hobby Club is as per University Policy framed for Hobby Club.

Question Paper Structure

1. *The paper shall consist of 9 questions. Out of which, first question shall be of short answer type and will be compulsory. Question No. 1 shall contain 8 parts representing all units of the syllabus and students shall have to answer all parts.*
2. *The remaining 8 questions shall have internal choice. The weightage for each question shall be 16 marks.*

Program Outcomes for Post Graduate Program (CBCS) in the Faculty of Sciences

PO1	Knowledge	Capable of demonstrating comprehensive disciplinary knowledge gained during course of study
PO2	Communication	Ability to communicate effectively on general and scientific topics with the scientific community and with society at large
PO3	Problem Solving	Capability of applying knowledge to solve scientific and other problems
PO4	Individual and Team Work	Capable to learn and work effectively as an individual, and as a member or leader in diverse teams, in multidisciplinary settings.
PO5	Investigation of Problems	Ability of critical thinking, analytical reasoning and research based knowledge including design of experiments, analysis and interpretation of data to provide conclusions
PO6	Modern Tool usage	Ability to use and learn techniques, skills and modern tools for scientific practices
PO7	Science and Society	Ability to apply reasoning to assess the different issues related to society and the consequent responsibilities relevant to the professional scientific practices
PO8	Life-Long Learning	Aptitude to apply knowledge and skills that are necessary for participating in learning activities throughout the life
PO9	Environment and Sustainability	Ability to design and develop modern systems which are environmentally sensitive and to understand the importance of sustainable development.
PO10	Ethics	Apply ethical principles and professional responsibilities in scientific practices
PO11	Project Management	Ability to demonstrate knowledge and understanding of the scientific principles and apply these to manage projects

Program Specific Outcomes for Post Graduate Diploma in Computer Applications (CBCS)

After successful completion of the program, a student will be able to:

PSO1	Develop competency to administer knowledge and awareness in the computing discipline along with learning aptitude for lifelong endurance in professional realm.
PSO2	Develop proficiency to adapt to contemporary technologies, skills and models for computing practice.
PSO3	Acquire expertise to adopt skills realized during research, experimentation and trending technology cognizance to solve industrial problems.
PSO4	Promote professional competence to aspire careers in Commercial/ Government Sectors, Academics/ consultancy/ Research and Development for technological innovations, and collateral fields related to Computer Science and Information Technology.
PSO5	Foster analytical skills for programming and adept computer based designing of systems in the domains concordant to Algorithm Design, System Software, Web and Application Designing, Data Science & Analytics, Artificial Intelligence & Machine Intelligence, Graphics and Visualization, and Networking Services.

Outline of Type of courses

- **Core Course**: A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.
- **Discipline Specific Elective (DSE) Course**: Elective courses may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective. The University/Institute may also offer discipline related Elective courses of interdisciplinary nature (to be offered by main discipline/subject of study).
- **Skill Enhancement Courses (SEC):** courses are the courses based upon the content that leads to Knowledge enhancement. These courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills. These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge.
- **Open Elective Courses (OEC):** For Open Elective courses, students will have to choose a course from the list of open electives offered by other Departments of University.
- **Ability Enhancement Courses (AEC):** These courses enhance the ability of a student which includes Communication Skills course.

Outline of Mode of Learning

- **Self-Learning (SL):** Self learning by students using prescribed open learning resource.
- **Guided Self Learning (GSL):** Guided Self learning-teachers to brief students about the open learning resources.
- **Blended Learning (BL):** Blended learning in the classroom-using traditional teaching combined with digital learning.
- **Classroom Learning (CL):** Only classroom, lab or field learning.

Self-Learning Courses (SL)

Guidelines:

Objective: These courses intend to create habits of reading books and to develop writing skills in a manner of creativity and originality. The students are to emphasis his/her own ideas/words which he/she has learnt from open learning resources, different books, journals and newspapers and deliberate the same by adopting different ways of communication techniques and adopting time scheduling techniques in their respective fields of research.

Aims:

- To motivate the students for innovative, research and analytical work
- To inculcate the habit of self-study and comprehension
- To infuse the sense of historical back ground of the problems
- To assess intensity of originality and creativity of the students

Instructions for Students

- Each student has to select a topic related to title of the course.
- Each student has to prepare a manuscript related to title of the course.
- Expected to be creative and original in approach.
- Submit handwritten manuscript of A4 size 8-10 pages.
- Organize manuscript in three broad steps:
    - Introduction
    - Main Body
    - Conclusions
- Use headings and sub-headings.
- Use graphics wherever necessary.
- Give a list of books/references cited/used.

The examiner will assess the students as follows:

Maximum Marks-25

- Manuscript :10 Marks
- Viva-Voce :15 marks.

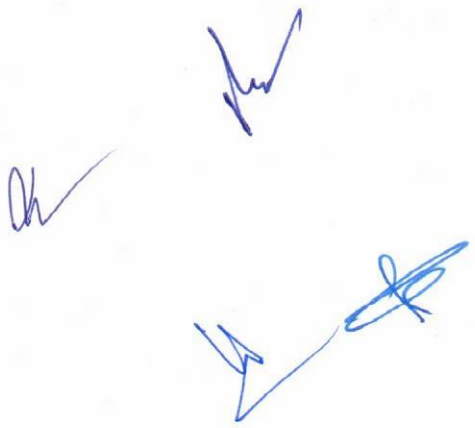
Guided Self-Learning Courses (GSL)

Guidelines:

Each student has to select a topic and prepare a presentation related to title of the course based on guided self-learning. Head of the department will create a mentor-mentee group (ten students per group). A mentor will guide mentees in choosing topic and preparing presentation. Each student will have to deliver a presentation of 15 minutes' duration before the students and teachers of the department. **A three-member committee (mentor of student and two teachers of the department of different branches) duly approved by the departmental council will be constituted to evaluate the presentation.** The following factors will be taken into consideration while evaluating the students.

Maximum Marks-25

Presentation: 10 marks
Depth of the subject matter: 10 marks
Viva-Voce: 05 marks



w.e.f. 2021-2022

Scheme of Examination for PGDCA

Semester: 1st (w.e.f. 2021-22) **Credits – 24** **Marks – 925**

Sr. No.	Course Code	Title of the Course	Mode of Learning	Course Type	Credit			Contact Hours per week			Examination Scheme			Total Marks
					Theory	Practical/ Seminar	Total	Theory	Practical/ Seminar	Total	External Marks	Internal Marks	Practical/ Seminar Marks	
1	21PGDCA101	Mathematical Foundations of Computing	CL/BL	CC	3	--	3	4	--	4	80	20	--	100
2	21PGDCA102	Data Structure using C	CL/BL	CC	3	--	3	4	--	4	80	20	--	100
3	21PGDCA103	Database Management System	CL/BL	CC	3	--	3	4	--	4	80	20	--	100
4	21PGDCA104	Fundamentals of web Designing	CL/BL	CC	3	--	3	4	--	4	80	20	--	100
5	21PGDCA105	Computer Architecture and Organization	CL/BL	CC	3	--	3	4	--	4	80	20	--	100
6	21PGDCA106	LAB - I (Based on 21PGDCA102)	CL	SEC	--	2	2	--	4	4	--	20	80	100
7	21PGDCA107	LAB - II (Based on 21PGDCA103)	CL	SEC	--	2	2	--	4	4	--	20	80	100
8	21PGDCA108	LAB - III (Based on 21PGDCA104)	CL	SEC	--	2	2	--	4	4	--	20	80	100
9	21PGDCA109	Seminar-I	GSL	SEC	1	--	1	1	--	1	--	25	--	25
10		Open Elective-I/MOOCs Courses	BL	OEC	2	--	2	2	--	2	80	20	--	100
		Total					24			35				925

CC - Core Course; **SEC-Skill Enhancement Course;** **AEC- Ability Enhancement Course;**
OEC-Open Elective Course

Note: For Open Elective-I, Students will have to choose a course from the list of open electives offered by other Departments of the University. The Syllabi & list of various Open Elective Courses offered is available on University Website.

w.e.f. 2021-2022

Scheme of Examination for PGDCA

Semester: 2nd (w.e.f. 2021-22) **Credits – 23** **Marks – 875**

Sr. No.	Course Code	Title of the Course	Mode of Learning	Course Type	Credit			Contact Hours per week			Examination Scheme			Total Marks
					Theory	Practical/ Seminar	Total	Theory	Practical/ Seminar	Total	External Marks	Internal Marks	Practical/ Seminar Marks	
1	21PGDCA201	Operating System and UNIX	CL/BL	CC	3	--	3	4	--	4	80	20	--	100
2	21PGDCA202	Data Communication and Computer Networks	CL/BL	CC	3	--	3	4	--	4	80	20	--	100
3	21PGDCA203	Data Mining	CL/BL	CC	3	--	3	4	--	4	80	20	--	100
4	21PGDCA204	Object Oriented Programming using JAVA	CL/BL	CC	3	--	3	4	--	4	80	20	--	100
5	21PGDCA205	Artificial Intelligence	CL/BL	CC	3	--	3	4	--	4	80	20	--	100
6	21PGDCA206	LAB - IV (Based on 21PGDCA201)	CL	SEC	--	2	2	--	4	4	--	20	80	100
7	21PGDCA207	LAB - V (Based on 21PGDCA204)	CL	SEC	--	2	2	--	4	4	--	20	80	100
8	21PGDCA208	Programming in MATLAB	CL	SEC	--	2	2	--	4	4	--	20	80	100
9	21PGDCA209	Seminar-II	SL	SEC	--	1	1	--	--	--	--	--	25	25
10	21CS100	Communication Skills	BL	AEC	--	1	1	--	2	2	--	50	--	50
	Total						23			34				875

CC - Core Course; SEC-Skill Enhancement Course; AEC- Ability Enhancement Course;

Post Graduate Diploma in Computer Applications
Semester-I

21PGDCA101
Mathematical Foundations of Computing

Credit: 3	**Contact Hours per week: 4**	**External Examination: 80**
Internal Assessment: 20	**Max. Time: 3 Hrs**	**Maximum Marks: 100**

Objectives of the course

- To develop and understand the mathematical and logical basis to many modern techniques in computing like machine learning, programming language design, and concurrency.

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

UNIT I

Sets: Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, Simple Applications. Relations and **Functions:** Properties of Relations, Equivalence Relation, Partial Order Relation, Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions.

UNIT – II

Propositional Logic: Proposition logic, basic logic, Logical Connectives, truth tables, tautologies, contradiction, Logical implication, Logical equivalence, Normal forms, Theory of Inference and deduction. **Predicate Calculus:** Predicates and quantifiers. Mathematical Induction.
Matrices: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint and Inverse of a matrix. Determinants: Definition, Minors, Cofactors, Properties of Determinants, Applications of determinants in finding area of triangle, solving a system of linear equations.

UNIT – III

Graph: Definition, walks, paths, trails, connected graph, regular and bipartite graph, cycles and circuits. Tree and rooted tree, Spanning tree, Eccentricity of a vertex radius and diameter of a graph, Central graphs. Centre(s) of a tree. Hamiltonian and Eulerian graph, planar graphs

UNIT – IV

Probability and Distribution: Probability spaces, conditional probability, independence; Discrete random variables, Independent random variables, the multinomial distribution, Poisson approximation to the binomial distribution, infinite sequences of Bernoulli trials, sums of independent random variables; Expectation of Discrete Random Variables, Moments, Variance of a sum, Correlation coefficient, Chebyshev's Inequality.

Course Outcome

After completion of course, students would be able to understand:

- The basic notions of discrete and continuous probability.
- The methods of statistical inference and the role that sampling distributions play in those methods.
- Correct and meaningful statistical analyses of simple to moderate complexity.

Suggested Readings:

1. C.L.Liu: *Elements of Discrete Mathematics, McGraw Hill.*
2. Lipschutz, Seymour: *Discrete Mathematics, Schaum's Series.*
3. John Vince: Foundation Mathematics for Computer Science, Springer.

4. Trembley, J.P & R. Manohar: *Discrete Mathematical Structure with Application to Computer Science, TMH.*
5. Kenneth H. Rosen: *Discrete Mathematics and its applications, TMH.*
6. M. Mitzenmacher and E. Upfal. Probability and Computing: Randomized Algorithms and Probabilistic Analysis
7. Doerr Alan & Levasseur Kenneth: *Applied Discrete Structures for Computer Science, Galgotia Pub. Pvt. Ltd.*
8. Babu Ram: *Discrete Mathematics, Vinayek Publishers, New Delhi.*

Post Graduate Diploma in Computer Applications
Semester-I

21PGDCA102
Data Structure using C

Credit: 3	**Contact Hours per week: 4**	**External Examination: 80**
Internal Assessment: 20	**Max. Time: 3 Hrs**	**Maximum Marks: 100**

Objectives of the course

- To impart the basic concepts of data structures and algorithms.
- To understand concepts about searching and sorting techniques.
- To understand basic concepts about stacks, queues, lists, trees and graphs.
- To enable them to write algorithms for solving problems with the help of fundamental data structures.

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

UNIT-I

Programming in C: Introduction to C, Data type, constants and variable; Structure of a C program, Operators and Expressions, Control statements: Sequencing, Alteration and Iteration; Arrays: Representation of single and multidimensional arrays; String and pointers, Functions, Recursion.

UNIT-II

Data Structures: Definition and its types, Abstract Data Types, Review of strings: String representation and manipulation, Static and dynamic memory storage, Arrays, matrices, sparse matrices, multi-dimensional arrays, operations on arrays. Linked Lists, List Types (singly, doubly, singly circular, header, doubly circular), Operations on Lists – create, insert, delete, search, Applications of linked list

UNIT-III

Stacks: Definition, Array implementation of stacks, Linked implementation of stacks, Applications of Stacks: Infix, Postfix and prefix expression, conversions and evaluation of expressions.
Queues: Definition, Array implementation of queues, Linked implementation of queues, Circular queues, Priority queues, Double-ended queues
Searching and Sorting: Linear search, Binary search, Insertion sort, selection sort, Bubble sort, Merge sort, Quick Sort, Heap Sort; Hashing, Hash table, Hash functions.

UNIT-IV

Trees: Binary Trees and their properties, Linked and static Representation of binary trees, Complete Binary Tree, Threaded Binary tree, Different tree traversal algorithms, Binary Search Tree (create, delete, search, insert, display) and its complexity analysis, AVL Trees, Balanced multi-way search trees.
Graphs: Definition, Array and linked representation of graphs, Graph Traversal (BFS and DFS), Adjacency matrix and adjacency lists, path matrix, Finding Shortest Path - Warshall's Algorithm.

Course Outcomes

After completion of course, students would be able to understand:

- For a given algorithm student will able to analyze the algorithms to determine the time and computation complexity and justify the correctness.
- For a given Search problem (Linear Search and Binary Search) student will able to implement it.

- For a given problem of Stacks, Queues and linked list student will able to implement it and analyze the same to determine the time and computation complexity.
- Student will able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity.
- Student will able to implement Graph search and traversal algorithms and determine the time and computation complexity.

Suggested Reading:

1. Fundamentals of Data Structures: *Illustrated Edition by Ellis Horowitz, Sartaj Sahni, Computer Science Press.*
2. Schaum's outline series:*Data Structure, TMH.*
3. Tenenbaum, Langsam, Augenstein: *Data Structures using C, Pearson Education.*
4. E. Horowitz and S. Sahani:*Fundamentals of Data Structures, Galgotia Book source Pvt. Ltd.*
5. Bala Guruswamy: *Data Structures Using C, TMH.*

Post Graduate Diploma in Computer Applications
Semester-I

21PGDCA103
Database Management System

Credit: 3	Contact Hours per week: 4	External Examination: 80
Internal Assessment: 20	Max. Time: 3 Hrs	Maximum Marks: 100

Objectives of the course

- To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency, distributed database, and intelligent database, Client/Server (Database Server), Data Warehousing.
- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modelling, designing, and implementing a DBMS.

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

UNIT I

Database system architecture: Data Abstraction, Data Independence, Data Definition Language (DDL), Data Manipulation Language (DML).
Data models: Entity-relationship model, network model, relational and object oriented data models, integrity constraints, data manipulation operations.

UNIT II

Relational query languages: Relational algebra, Tuple and domain relational calculus, SQL3, DDL and DML constructs, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQL server.
Relational database design: Domain and data dependency, Armstrong's axioms, Normal forms, Dependency preservation, Lossless design.
Query processing and optimization: Evaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization algorithms.

UNIT III

Transaction processing: Concurrency control, ACID property, Serializability of scheduling, Locking and timestamp based schedulers, Multi-version and optimistic Concurrency Control schemes, Database recovery.

UNIT IV

Database Security: Authentication, Authorization and access control, DAC, MAC and RBAC models, Intrusion detection, SQL injection.
Advanced topics: Object oriented and object relational databases, Logical databases, Web databases, Distributed databases, Data warehousing and data mining.

Course Outcomes

After completion of course, students would be able to understand:

- For a given query write relational algebra expressions for that query and optimize the developed expressions.
- For a given specification of the requirement design the databases using E-R method and normalization.
- For a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability.

- Implement the isolation property, including locking, time stamping based on concurrency control and serializability of scheduling.

Suggested Readings:

1. Database System Concepts: *6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill.*
2. Principles of Database and Knowledge – Base Systems: Vol 1 by J. D. Ullman, Computer Science Press.
3. Fundamentals of Database Systems: 5th Edition by R. Elmasri and S. Navathe, Pearson Education.
4. Foundations of Databases: Reprint by Serge Abiteboul, Richard Hull, Victor Vianu, Addison-Wesley.

Post Graduate Diploma in Computer Applications
Semester-I

21PGDCA104
Fundamentals of Web Designing

Credit: 3	**Contact Hours per week: 4**	**External Examination: 80**
Internal Assessment: 20	**Max. Time: 3 Hrs**	**Maximum Marks: 100**

Objectives of the course:

- To impart the basic concepts of Web designing and web programming.
- To understand concepts about client side and server side programming.

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

UNIT-I

Introduction to Web programming – Introduction to SGML features – HTML, XHTML, DHTML, XML – HTML Vs XML – Creating XML documents – Parsing an XML document – Writing well-formed documents – Organizing elements with namespaces – Defining elements in a DTD – Declaring elements and attributes in a DTD. Overview of HTML - basic formatting tags - heading, paragraph, underline break, bold, italic, underline, superscript, subscript, font and image. Attributes - align, color, bgcolor, font face, border, size. Navigation Links using anchor tag - internal, external, mail and image links. Lists - ordered, unordered and definition, Table tag, HTML Form controls - form, text, password, text area, button, checkbox, radio button, select box, hidden controls.

Unit II

Cascading Style Sheets: Introduction, Inline, Internal, External CSS, Linking CSS to Web Page. Client–Side Programming: Introduction to JavaScript, Basic Syntax, Variables and Data types, Statements, Operators, Literals, Functions, Objects, Arrays. XML: Relation between XML and HTML, Goals of XML, Structure and Syntax of XML, Well Formed XML, DTD and its Structure, tree structures in data organization, Searching with XPath.

Unit III

Web Application and Information Gathering: HTTP Request, Response, Header Fields and HTTPS, Understanding Same Origin, Sessions, Web Application Proxies. **Web server** – role - Apache Web Server – Introduction – Architecture – Features - Apache's Role in the Internet – LAMP – WAMP - Installation and Configuration - Build and Install Apache Web Server - Verify Initial Configuration Start, Stop, and Status the Apache Server Process.

UNIT-IV

Server side programming – server side scripts – PHP – Designing dynamic web pages using PHP - Defining PHP variables – variable types – operators – control flow constructs in PHP – passing form data between pages - Establishing connection with MySQL database – managing database

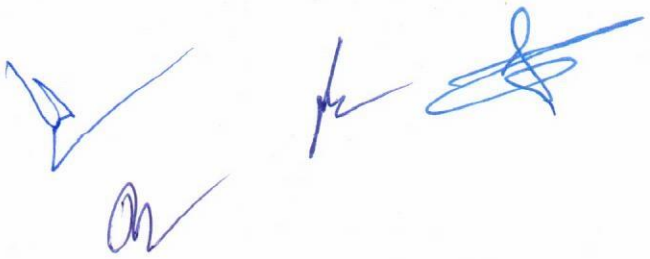
Course Outcomes

After completion of course, students would be able to understand:

- The client side and server side scripts used in programming
- The basic concept of designing websites
- Database connectivity with the web pages

Suggested Readings:

1. Dick Oliver: Tech Yourself HTML 4 in 24 Hours, Techmedia.
2. Satish Jain: "O" – Level Information Technology.
3. AchyutGodbole, "Web Technologies", Tata McGraw Hill, India.
4. Craig Zacker: 10 minutes Guide to HTML Style Sheets, PHI.
5. V.K. Jain: "O" – Level Information Technology, BPB Publications.
6. Gill Nasib Singh: Essentials of Computer and Network Technology, Khanna Books Publishing Co., New Delhi.
7. Margaret Levine Young: Internet – The Complete Reference
8. Harley Hahn: The Internet – Complete Reference, TMH.
9. Rajender Singh Chhillar: Application of IT to Business, Ramesh Publishers, Jaipur.



Post Graduate Diploma in Computer Applications
Semester-I

21PGDCA105
Computer Architecture and Organization

Credit: 3	**Contact Hours per week: 4**	**External Examination: 80**
Internal Assessment: 20	**Max. Time: 3 Hrs**	**Maximum Marks: 100**

Objectives of the course

- To have a thorough understanding of the basic structure and operation of a digital computer
- To study the different ways of communicating with I/O devices and standard I/O interfaces
- To learn the architecture and assembly language programming of 8085 microprocessor
- To study peripherals and their interfacing with 8085 microprocessor

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

UNIT-I

Boolean Algebra and Logic Gates: Basic definition, Axiomatic Definition, Basic theorem and Properties of Boolean algebra, Minterms and Maxterms, Logic Operations, Digital logic gates, IC digital logic families

Simplification of Boolean functions: Different types map method, product of sum simplification, NAND or NOR implementation, Don't care condition, Tabulation method, Adder, subtractor, Decoder, Encoder, Code Conversion, Universal Gate.

UNIT-II

Sequential Logic: Flip-flops, Triggering of Flip-flops, Analysis of clocked sequential circuits, State reduction and Assignment, Flip-flop excitation, Design of counters, Design with state equations

Overview of Register Transfer And Microoperations: Register Transfer Language, Register transfer, Bus and Memory transfer, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic Logic Shift Unit

UNIT-III

Basic Computer Organization and Design: Instruction codes, Computer registers, Computer instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions, Input-output and interrupt, Design Basic computer, Design of Accumulator Unit

Programming The Basic Computer: Introduction, Machine Language, Assembly Language, the Assembler, Program loops, Programming Arithmetic and logic operations, Subroutines, I-O Programming

UNIT-IV

Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction format, Addressing Modes, Data transfer and manipulation, Program Control, Reduced Instruction Set Computer (RISC).

Pipeline Processing: Pipeline and Vector Processing, Parallel processing, Pipelining, Arithmetic Pipeline, Instruction pipeline and Arrays Processors.

Course Outcomes

- Understanding Logic gates, flip flops and counter
- Clear Understanding of Computer Architecture
- Pipeline processing
- RISC and CISC architectures

- Develop a base for advance micro-processors

Suggested Readings:

1. Computer System Architecture: By M. Morris Mano.
2. Structured Computer Organization: By Tanenbaum.
3. Computer Organization: By Stallings.
4. Computer Architecture and Organization: By Hayes.
5. Microprocessor Architecture, Programming, and Applications with the 8085 - Ramesh S. Gaonkar Pub: Penram International.

Post Graduate Diploma in Computer Applications
Semester-I

21PGDCA106
LAB - I (Based on 21PGDCA102)

Credit: 2	Contact Hours per week: 4	External Practical Examination: 80
Internal Assessment: 20	Max. Time: 3 Hrs	Maximum Marks: 100

Note: Every student shall individually prepare a practical file consisting of 10 practical related to Problem solving in C Language. A panel consisting of two teachers (internal and External) should take the practical examination after the end of the semester. Marks are distributed as under:

Practical Record: 10 Marks

Viva-voce: 40 Marks

Written exam/executing the practical on the PC: 30 Marks

Course Outcomes: By the end of the course the students will be able to:

CO1: Able to develop basic programs of in C language and Use various problem solving techniques.
CO2: Programming in C by using functions, structures and union.
CO3: Able to use various searching and sorting algorithms using arrays in C
CO4: Able to implement Stack, Queue, Linked List, Trees, Graphs
CO5: Able to solve various problems using C language on small scale.

List of Practical:

1. Write a C program to implement recursive and non-recursive Linear search and Binary search
2. Write a C program to implement Searching and Sorting
3. Write a C program to implement Linked List.
4. Write a C program to implement list ADT to perform following operations a) Insert an element into a list. b) Delete an element from list c) Search for a key element in list d) count number of nodes in list
5. Write C program to implement the following using a singly linked list. a) Stack ADT b) Queue ADT
6. Write C programs to implement the deque (double ended queue) ADT using a doubly linked list and an array.
7. Write a C program to perform the following operations: a) Insert an element into a binary search tree. b) Delete an element from a binary search tree. c) Search for a key element in a binary search tree.
8. Write C programs for implementing the following sorting methods: Merge sort b) Heap sort
9. Write C programs that use recursive functions to traverse the given binary tree in a) Preorder b) inorder and c) postorder.
10. Write a C program to perform the following operations a) Insertion into a B-tree b) Deletion from a B-tree
11. Write a C program to perform the following operations a) Insertion into an AVL-tree b) Deletion from an AVL-tree

12. Program for Queue and Circular Queue Task
14. Program for Single Link List to insert a node at any point and display all nodes Task
15. Program for Single Link List to delete a node at any point and display all nodes

Post Graduate Diploma in Computer Applications
Semester-I

21PGDCA107
Lab-II (Based on 21PGDCA103)

Credit: 2	Contact Hours per week: 4	External Practical Examination: 80
Internal Assessment: 20	Max. Time: 3 Hrs	Maximum Marks: 100

Note: Every student shall individually prepare a practical file consisting of 10 practical related to Database Management System. A panel consisting of two teachers (internal and External) should take the practical examination after the end of the semester. Marks are distributed as under:

Practical Record: 10 Marks

Viva-voce: 40 Marks

Written exam/executing the practical on the PC: 30 Marks

Course Outcomes: By the end of the course the students will be able to:

CO1: Knowledge of Basic fundamentals of database management and implementation of MYSQL Queries.
CO2: Basic understanding of DDL, DML statements
CO3: Basic operations and queries on data

List of Practical:

1. To study DBMS, RDBMS.
2. To study Data Definition language Statements.
3. To study Data Manipulation Statements.
4. Study of SELECT command with different clauses.
5. Study of SINGLE ROW functions (character, numeric, Data functions).\
6. Study of GROUP functions (avg, count, max, min, Sum).
7. Study of various type of SETOPERATORS (Union, Intersect, Minus).
8. Study of various types of Integrity Constraints.
9. Study of Various types of JOINS.
10. To study Views and Indices.

Post Graduate Diploma in Computer Applications
Semester-I

21PGDCA108
Lab-III (Based on 21PGDCA104)

Credit: 2	Contact Hours per week: 4	External Practical Examination: 80
Internal Assessment: 20	Max. Time: 3 Hrs	Maximum Marks: 100

Note: Every student shall individually prepare a practical file consisting of 10 practical related to Database Management System. A panel consisting of two teachers (internal and External) should take the practical examination after the end of the semester. Marks are distributed as under:

Practical Record: 10 Marks
Viva-voce: 40 Marks
Written exam/executing the practical on the PC: 30 Marks

Course Outcomes: By the end of the course the students will be able to:
CO1: Designing the web page using HTML, DHTML, JavaScript, CSS, PHP
CO2: Writing the client side and server side scripts

List of Practical:

1. Create a simple HTML page with title, heading, and paragraph, formatting tags, hyperlinks, list items and image elements.
2. Create a simple HTML page having image elements with the use of map.
3. Create a simple HTML page having a complex table.
4. Create a simple HTML page having multiple Frames.
5. Embed Video in a HTML page.
6. Create a simple HTML page that uses Inline CSS
7. Create a simple HTML page that uses Document level CSS
8. Create a simple HTML page that uses External level CSS
9. Create a HTML page that uses all CSS properties Contents Tasks List Description
10. Write a simple JavaScript to print text on to the HTML document.
11. Write a simple script in head portion of HTML document.
12. Write a simple script in body portion of the HTML document.
13. Write an external script and link it to the HTML document.
14. Write a PHP script to get the PHP version and configuration information
15. Write a PHP script to display any multi-line string
16. Write a PHP script to place a variable to a title and as hyperlink of the Web page
17. Create a simple HTML form and accept the user name and display the name through PHP echo statement.
18. Use MySQL console to use database

Post Graduate Diploma in Computer Applications
Semester-II

21PGDCA201
Operating System and UNIX

Credit: 3	Contact Hours per week: 4	External Examination: 80
Internal Assessment: 20	Max. Time: 3 Hrs	Maximum Marks: 100

Objectives of the course

- Basic Concepts of Operating Systems
- Explain basic Unix concepts related to concurrency and control of programs
- Identify and define key terms related to operating system
- Capability to name and state the function of Unix commands

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

UNIT-I

Operating systems overview: Operating systems as an extended machine & resource manager, Operating systems classification; Operating systems and system calls; Operating systems architecture.

Process Management functions: Process model, hierarchies, and implementation; process states and transitions; multi-programming, multi-tasking, multi-threading; level of schedulers and scheduling algorithms.

UNIT-II

Memory Management and Virtual Memory : Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging, Demand Paging, Performance of Demanding Paging, Page Replacement, Page Replacement Algorithm, Allocation of Frames, Thrashing.

UNIT-III

Device Management function: I/O devices and controllers interrupt handlers, device independent I/O software, user-space I/O software; disk scheduling; clock hardware software; terminal input/output software.

File management functions: file naming, structure, types, access mechanisms, attributes and operations; directory structures and directory operations; file space allocations; file sharing, file locking; symbolic links; file protection and security: distributed file systems.

UNIT-IV

Concurrent programming: sequential and concurrent process; precedence graph, Bernsterins condition; time dependency and critical code section, mutual exclusion problem; classical process coordination problems; deadlock handling, inter-process communication.

UNIX Operating System: Overview of UNIX OS in general and implementation of all above functions in Unix Operating System.

Course Outcomes

- Be able to understanding basic operating system fundamentals
- Know how an operating system can be used as a service

- Familiarity with Linux programming concepts
- Have a foundation stone to understand operating systems working

Suggested Readings:

1. M.J. Bach "Design of UNIX O.S. ", Prentice Hall of India.
2. Y.Kanetkar "Unix shell programming", BPB Pub.Tenenbaum: Modern Operating Systems, Prentice-Hall.
3. Silberschatz, Galvin, Gagne, "Operating System Concepts", 8th Edition, John Wiley & Sons Inc.
4. Peterson, James L: Operating System Concepts, Addison Wesley Publ. &Silberschatz Comp.
5. Deitel, H.M.: An Introduction to Operating System, Addison Wesley Publ. Comp.
6. Brain Kernighen& Rob Pike: The UNIX Programming Environment, Prentice Hall.

Post Graduate Diploma in Computer Applications
Semester-II

21PGDCA202
Data Communication and Computer Networks

Credit: 3	**Contact Hours per week: 4**	**External Examination: 80**
Internal Assessment: 20	**Max. Time: 3 Hrs**	**Maximum Marks: 100**

Max. Time: 3 Hrs

Objectives of the course

- Explain basic concepts related to Data Communication
- To explore the issues and challenges of protocols design while delving into TCP/IP protocol suite.
- To study the types of modes and channels for communications
- To explore the inter-working of various layers of OSI.

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

UNIT-I

Introduction to Computer Network: Types of Networks, Network Topologies, OSI and TCP/IP Reference Models; Comparison of Models. Data Communications Concepts: Digital Vs. Analog communication; Parallel and Serial Communication; Synchronous, Asynchronous and Isochronous Communication; Communication modes: simplex, half duplex, full duplex; Multiplexing; Transmission media: Wired-Twisted pair, Coaxial cable, Optical Fiber, Wireless transmission: Terrestrial, Microwave, Satellite, Infra red.

UNIT-II

Communication Switching Techniques: Circuit Switching, Message Switching, Packet Switching. Data Link Layer Fundamentals: Framing, Basics of Error Detection, Forward Error Correction, Cyclic Redundancy Check codes for Error Detection , Flow Control. Media Access Protocols: ALOHA, Carrier Sense Multiple Access (CSMA), CSMA with Collision Detection (CSMA/CD), Token Ring, Token Bus.

UNIT-III

High-Speed LAN: Standard Ethernet, Fast Ethernet, Gigabit Ethernet, 10G; Wireless LANs: IEEE 802.11, Bluetooth. Network Layer: IP Addressing and Routing, Network Layer Protocols: IPv4 (Header Format and Services), ARP, ICMP (Error Reporting and Query message); IPv6 (Header Format and Addressing).

UNIT-IV

Transport Layer: Process-to-Process Delivery: UDP, TCP; Connection Management by TCP; Basics of Congestion Control. Application Layer: Domain Name System (DNS); SMTP; HTTP; WWW. Network Security: Security Requirements and attacks; Cryptography: Symmetric Key (DES, AES), Public Key Cryptography (RSA); Firewall

Course Outcomes

- Familiar with the basic Networking Protocols
- Be able to understand some of the Communication Techniques
- Detailed understanding of Various Layers in OSI and TCP/IP reference models

Suggested Readings:

1. B. Muthukumaran, "Introduction to High Performance Networks", Vijay Nicole Imprints.
2. Wayne Tomasi, "Introduction to Data Communications and Networking", Pearson Education.
3. James F. Kurose, Keith W. Ross, "Computer Networking, A Top-Down Approach Featuring the Internet", Pearson Education.
4. Andrew S. Tanenbaum, "Computer Networks", Pearson Education.
5. Mahbub Hassan, Raj Jain, "High Performance TCP/IP Networking, Concepts, Issues, and Solutions", Pearson Education.
6. Andrew S. Tanenbaum, Marten Van Steen, "Distributed Systems-Principles & Paradigms", Pearson Education.

Post Graduate Diploma in Computer Applications
Semester-II

21PGDCA203
Data Mining

Credit: 3	Contact Hours per week: 4	External Examination: 80
Internal Assessment: 20	Max. Time: 3 Hrs	Maximum Marks: 100

Objectives of the course

- Basic Concepts of Mining the relevant information
- Basic understanding about the processing of data
- To study the different types of techniques for Data Mining
- To analyze data, choose relevant models and algorithms for respective applications

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Unit I

Introduction to Data Mining: Scope of Data Mining, How does Data Mining Works, Predictive Modelling on Data Mining, and Architecture for Data Mining, Profitable Applications of Data Mining, Data Mining Tools

Business Intelligence: Introduction, Business Intelligence, Business Intelligence tools, Business Intelligence Infrastructure, Business Intelligence Applications, BI versus Data Warehouse, BI versus Data Mining, Future of BI.

Unit II

Data Pre-processing: Data Pre-processing Overview, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

Data Mining Techniques- An Overview: Introduction of Data MiningTechniques, Data Mining Versus Database Management System, Data Mining Techniques- Association rules, Classification, Regression, Clustering, Neural networks.

Unit III

Clustering: Introduction of Clustering, Cluster Analysis, Clustering Methods- K means, Hierarchical clustering, Agglomerative clustering, Divisive clustering, clustering and segmentation software, evaluating clusters.

Web Mining: Terminologies, Categories of Web Mining – Web Content Mining, Web Structure Mining, Web Usage Mining, Applications of Web Mining, and Agent based and Data base approaches, Web mining Software

Unit IV

Applications of Data mining: Business Applications Using Data Mining- Risk management and targeted marketing, Customer profiles and feature construction, Medical applications (diabetic screening), Scientific Applications using Data Mining, Other Applications.

Course Outcomes

- Implement different data mining techniques on the pre-processed data set for extracting hidden patterns from data.
- Identify appropriate data mining algorithms to solve real world problems

- Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining

Suggested Readings:

1. Jiawei Han &MichelineKamber: Data Mining - Concepts & Techniques, Harcourt India PVT Ltd. (Morgan Kaufmann Publishers).
2. I.H. Whiffen: Data Mining, Practical Machine Cearing tools & techniques with Java (Morgan Kanffmen)
3. A.K. Pujari: Data Mining Techniques, University Press.
4. Pieter AdriaansDolfZantinge: Data Mining, Addition Wesley.

David Hand, HeikkiMannila, and Padhraic Smyth: Principles of Data Mining, PHI Publication.

Post Graduate Diploma in Computer Applications
Semester-II

21PGDCA204
Object Oriented Programming using JAVA

Credit: 3	**Contact Hours per week: 4**	**External Examination: 80**
Internal Assessment: 20	**Max. Time: 3 Hrs**	**Maximum Marks: 100**

Objectives of the course

- Basic Concepts of Object Oriented Programming
- Basic understanding ofJAVA language
- To study the use of Java for GUI programming

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Unit I

Introduction to Java: Basics of Java programming, Data types, Variables, Operators, Control structures including selection, Looping, Java methods, Overloading, Math class, Arrays in java.

Objects and Classes: Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, StringBuffer, File, this reference

Unit II

Inheritance and Polymorphism: Inheritance in java, Super and sub class, Overriding, Object class, Polymorphism, Dynamic binding, Generic programming, Casting objects, Instance of operator, Abstract class, Interface in java, Package in java, UTIL package.

Unit III

Event and GUI programming: Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing.

Unit IV

I/O programming: Text and Binary I/O, Binary I/O classes, Object I/O, Random Access Files.

Multithreading in java: Thread life cycle and methods, Runnable interface, Thread synchronization, Exception handling with try-catch-finally, Collections in java, Introduction to JavaBeans and Network Programming.

Course Outcomes

- Familiar with the basic concepts of OOPS
- Implementing Java programs using Inheritance and Polymorphism
- Understanding the concept of Threading

Suggested Readings:

1. Patrick Naughton& Herbert Schildt.: Java 2.0: The Complete Reference, TMH.
2. HolznerSteven: Java 2, Swing, Servlets, JDBC & Java Beans Programming (Black Book), IDG Books India (P) Ltd.

3. Hatman& Eden: ASP with VBScript, SQL and HTML Programming Reference, IDG Books India(P), Ltd.
4. Jackson, J. : Java by Example, Sunsoft Press.
5. Wiber, J. : Using Java 2 Platform, PHI.
   Harold, E. : Java Secrets, Comdex.

Post Graduate Diploma in Computer Applications
Semester-II

21PGDCA205
Artificial Intelligence

Credit: 3	**Contact Hours per week: 4**	**External Examination: 80**
Internal Assessment: 20	**Max. Time: 3 Hrs**	**Maximum Marks: 100**

Objectives of the course

- To conceptualize the basic ideas and techniques underlying the design of intelligent systems
- To make students understand advanced representation formalism and search techniques
- To make students understand and Explore the mechanism of mind that enable intelligent thought and action.

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Unit-I

Introduction: Introduction to Artificial Intelligence, various definitions of AI, AI Applications and Techniques, Turing Test and Reasoning - forward & backward chaining. Introduction to Intelligent Agents, Rational Agent, their structure, reflex, model-based, goal-based, and utility-based agents, behaviour and environment in which a particular agent operates.

Unit-II

Problem Solving and Search Techniques: State space search, Problem Characteristics, Production Systems, Control Strategies, Breadth First Search, Depth First Search, iterative deepening, uniform cost search, Hill climbing and its Variations, simulated annealing, genetic algorithm search; Heuristics Search Techniques: Best First Search, A* algorithm, AO* algorithm, Minmax & game trees, refining minmax, Alpha – Beta pruning, Constraint Satisfaction Problem, Means-End Analysis.

Unit-III

Reasoning with Uncertain Knowledge: Different types of uncertainty - degree of belief and degree of truth, various probability constructs - prior probability, conditional probability, probability axioms, probability distributions, Bayes' rule, other approaches to modelling uncertainty such as Dempster-Shafer theory.

Fuzzy logic: Definition, Difference between Boolean and Fuzzy logic, fuzzy subset, fuzzy membership function, fuzzy expert system, Inference process for fuzzy expert system, fuzzy controller

Unit-IV

Expert system development life cycle: Problem selection, Prototype construction, Formalization, Implementation, Evaluation, Knowledge acquisition: Knowledge engineer, Cognitive behavior, Acquisition techniques. Knowledge representation: Level of representation, Knowledge representation schemes, Formal logic, Inference Engine, Semantic net, Frame, Scripts.

Course Outcome

- Ability to develop a basic understanding of AI building blocks presented in intelligent agents.

- Ability to choose an appropriate problem solving method and knowledge representation technique.
- Ability to analyze the strength and weaknesses of AI approaches to knowledge– intensive problem solving.
- Ability to design models for reasoning with uncertainty as well as the use of unreliable information.
- Ability to design and develop the AI applications in real world scenario.

Suggested Readings:

1. Rich Elaine and Knight Kevin: Artificial Intelligence, Tata McGraw Hill .
2. Tani Moto : Introduction to AI using LISP.
3. Patterson: Artificial Intelligence and Expert Systems.
4. Sangal Rajeev: LISP Programming, Tata McGraw Hill.
5. Balagurusamy : Artificial Intelligence & Technology.
6. Mishkoff, Henry C: Understanding Artificial Intelligence, BPB Publ.
7. Bharti & Chaitenya: Natural Language Processing, PHI

Post Graduate Diploma in Computer Applications
Semester-II

21PGDCA206
Lab-IV (Based on 21PGDCA201)

Credit: 2	Contact Hours per week: 4	External Practical Examination: 80
Internal Assessment: 20	Max. Time: 3 Hrs	Maximum Marks: 100

Note: Every student shall individually prepare a practical file consisting of 10 practical related to Data Structure and Programming in C++. A panel consisting of two teachers (internal and External) should take the practical examination after the end of the semester. Marks are distributed as under:

Practical Record: 10 Marks

Viva-voce: 40 Marks

Written exam/executing the practical on the PC: 30 Marks

Course Outcomes: By the end of the course the students will be able to:

CO1: Knowledge of Basic fundamentals of operating system and UNIX Commands
CO2: Able to write scripts and working with shell programming in UNIX Type Operating system.

List of Practical:

1. Getting started with UNIX / Linux: a) Basic Commands for login and logout, b) Change password, c) Shutdown or rebooting system
2. Commands for Basic Utilities: a) Calender, Help, command manual, b) date & time, current user status, knowing present working directory
3. Commands for Directories & File listing
4. Commands for identifying UNIX shell - Listing the shell variables - Changing the shell - Path setting - Setting Prompt variable Contents Tasks List Description
5. Commands for File Management
6. Commands for Directory Management
7. Commands to change file and directory access permissions
8. Using Pipes & filters & meta characters
9. Command to deal with processes - Listing of processes - Running foreground & background processes - Stopping processes
10. Commands for communication - Pinging another computer in the network
11. Commands for vi editor - Open and closing, Operation modes, editing, navigation, copying text, searching

Post Graduate Diploma in Computer Applications
Semester-II

21PGDCA207
Lab-V (Based on 21PGDCA204)

Credit: 2	Contact Hours per week: 4	External Practical Examination: 80
Internal Assessment: 20	Max. Time: 3 Hrs	Maximum Marks: 100

Note: Every student shall individually prepare a practical file consisting of 10 practical related to Python Programming A panel consisting of two teachers (internal and External) should take the practical examination after the end of the semester. Marks are distributed as under:

Practical Record: 10 Marks

Viva-voce: 40 Marks

Written exam/executing the practical on the PC: 30 Marks

Course Outcomes: By the end of the course the students will be able to:

CO1: Programming by using the Concept of OOPS like Inheritance and Polymorphism
CO2: Able to use various Loops and conditions in dealing with a real world problem
CO3: Able to implement types of Inheritance and concepts like Function Overloading and Overriding
CO4: Demonstrate in detailed on multilevel inheritance with suitable example.
CO5: Demonstrate on multiple Thread class and use set Priority method with suitable example.
CO6: Elaborate on runtime polymorphism with suitable example.
CO7: Demonstrate on applet with differentiate between main () method using suitable example

List of Practical:

1. A Simple Program in Class & Object.
2. A Program for Simple Inheritance.
3. A Program for Multilevel Inheritance.
4. A Program for Multiple Inheritance.
5. A Program of Polymorphism with Overloading.
6. Program of Polymorphism with Overriding.
7. A Program to Use Interface.
8. A Program to Use Abstract Class.
9. Write a program for Multiple Inheritance using Interface.
10. Write a program for using multidimensional array in java.

Post Graduate Diploma in Computer Applications
Semester-II

21PGDCA208
Programming in MATLAB

Credit: 2	Contact Hours per week: 4	External Practical Examination: 80
Internal Assessment: 20	Max. Time: 3 Hrs	Maximum Marks: 100

Objectives of the course

- To familiarize the student in introducing and exploring MATLAB & LABVIEW softwares.
- To enable the student on how to approach for solving Engineering problems using simulation tools.
- To prepare the students to use MATLAB/LABVIEW in their project works.
- To provide a foundation in use of this softwares for real time applications.

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

UNIT-I

Introduction to MATLAB programming, Basic of MATLAB programming, Variables and assignments, data types, operators, working with numbers, mathematical operations, functions, good programming style, commands, M-files.

Unit-II

Introduction to Vectors in MATLAB: Vector types, referencing the elements of vector, Matrix generations, Array operations and Linear Equations; Introduction to programming in Matlab: M-File scripts, M-File functions, Colon notations; Introduction to Matrices in Matlab: defining Matrix, Matrix functions, Vector operations, Matrix operations.

Unit-III

Looping and Decision Making: for loops, while loop, branching and nesting, if statement, if-else statement, else-if statement, subroutine, built in function and user defined functions, handling functions in m-files.

Unit-IV

Data Files: Data import and data output, read/write, Plotting and Graphics in MATLAB: Polar plot, 2D and 3D plots, mesh, contour, Algebra, Optimization, Numerical Integration, Numerical Differentiation, solving polynomial equations, Introduction to SIMULINK.

Course Outcomes:

- Ability to find importance of this software for Lab Experimentation.
- In-depth knowledge of providing virtual instruments on MATLAB Environment.
- Articulate importance of software's in research by simulation work.

Suggested Readings:

1. Amos Gilat, *MATLAB An Introduction With Applications 5ed,* Wiley, ISBM13: 978-1118629864
2. Krister Ahlersten, *An Introduction to Matlab,* Bookboon.com, ISBN:978-87-403-0283-7
3. Stephen J. Chapman,*MATLAB Programming for Engineers*, Cengage Learning, 2015

Post Graduate Diploma in Computer Applications
Semester-II

21CS100
Communication Skills

Credit: 1	Contact Hours per week: 2	Internal Assessment: 20
Max. Time: 3 Hrs	Maximum Marks: 50	

Objective of the course:

- To introduce the theory and practice of communicative skills so as to enable the students to communicate effectively and conduct themselves graciously in the business of life.

Note: One hour of classroom teaching will be devoted to the teaching of theory. In another hour, the students will be engaged in practical activities and the evaluation of their communication skills will be done by the internal examiner on the basis of classroom presentations, discussions and assignments.

Unit-I

Human Communication, Verbal and Non Verbal Communication, Barriers to communication; the seven C's of effective communication. Preparing for interviews, CV/ Bio-data, Group Discussion, Public Speaking, Mass Communication.

Unit -II

Common Courtesies, Introducing Oneself Formally and Informally; Introducing Oneself on Social Media; Speaking Strategies: Making Enquiries, Clarifications, Recommendations, Explanations, Rejections, etc.; Being Diplomatic; Telephonic Communication.

Unit-III

Conversational Practice in Various Situations: (meeting, parting, asking/talking about daily activities, at railway station, seeking information, buying at shops, asking about buses, travelling by bus, using expressions of time, talking about money, identifying people, at the post office, at the bank, at the grocery store, immediate family and relatives, hiring a taxi, talking about weather/weather conditions, breakfast or lunch at a restaurant, ordering food, dinner conversations, at the doctors clinic, quitting and finding jobs, office conversations, conversations about school/ college/ university, the English class, driving a car).

Students shall develop dialogue-based conversations on the above-mentioned situations.

Unit-IV

Personality Development Skills: Personal Grooming; Assertiveness; Improving Self-Esteem; Significance of Critical Thinking; Confidence Building; SWOC analysis.

Emotional intelligence: Recognizing and Managing Emotions and Situations; Stress and Anger Management; Positive Thinking; Developing Sense of Humour.

Course Outcomes

After completion of course, students would be able to understand:

- Modes of Communication including Verbal and Non-verbal communication
- To express effectively & with maximum efficiency.
- To develop Interpersonal skills