MNPE-09425068494

In Collaboration with

Karnataka State Open University

Manasagangotri, Mysore-6

Syllabus

Diploma in Computer Application

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Diploma in Computer Application
Programme Structure (Face to Face)

Code	Course Title	Credits
	1st Semester	
DCA101	Computer Fundamentals and Windows Based Application	3
DCA102	Communication Skills in English	3
DCA103	Programming in C	3
DCA104	Data Structure	3
DCA105	C Programming Lab	2
DCA106	Windows based Application lab	2
	Total Credits	**16**
	2nd Semester	
Code	**Course Title**	**Credits**
DCA201	Mathematics	3
DCA202	Computer Organization and Architecture	3 3
DCA203	DBMS	3
DCA204	OOPS with C++	2
DCA205	C++ Lab	2
DCA206	Data Structure Lab	3
	Total Credits	**16**

Detailed Syllabus

Semester I

DCA101 : Computer Fundamentals and Windows Based Applications

Unit- 1 Introduction to Computers, Need for Computer Literacy.

Unit- 2 Computer: The Definition, Basic Anatomy of Computers, Characteristics of Computers, Evolution of Computers, The Computer Generations

Section – 2	Basic Computer Organization
Unit- 3	Introduction, Components of a Digital Computer.
Unit-4	The Input Unit, The Output Unit, The Central Processing Unit, The Control Unit, The Main Memory Unit, Storage Unit.
Section – 3	Number Systems
Unit- 5	Introduction, Classification of Number System, Different Number Systems, Conversions, Arithmetic Operations in Binary Systems.
Section – 4	Processor and Memory
Unit- 6	Introduction, the Central Processing Unit, Registers, Instruction Sets, Program Interrupts, Processor Speed Memory, Memory Unit.
Unit- 7	Main Memory Organization, Main Memory Capacity, Other Types of Memory.
Section – 5	Secondary Storage Devices
Unit- 8	Introductions, Need of Secondary Storage Devices, Characteristics of Secondary Storage Devices, Types of Storage Devices.
Unit- 9	Magnetic Tape Systems, Magnetic Disk, Types of Disks, Optical Disk, Mass Storage Devices, Storage Hierarchy.
Section – 6	Input and Output Devices
Unit- 10	Introductions, Input Devices, Data Scanning Devices, Digitizer, Electronic Card Reader, Voice Recognition Devices.
Unit- 11	Vision Input System, Output Devices, Voice Response System, Screen Image Projector.
Section – 7	Computer Languages
Unit- 12	Introduction, Analogy with Natural Languages, Computer Programming Languages, Low Level Languages, High Level Languages (HLL).1

Unit- 13 Compiler Based and Interpreter based Language, Some High-level Languages, Some more High-level Languages.

Unit- 14 User-Friendly Languages, Object Oriented Languages, Characteristics of a Good Programming Language, Selecting a Language for coding an application Subprogram.

Section – 8 Application Software Packages and Internet

Unit- 15 Introductions, Word Processor Packages, Database Management Packages, Spreadsheet Packages, Office Automation Packages (Microsoft Office 2000).

Unit- 16 Desktop Publishing Software, Graphics, Multimedia and Animation Software, Application Software to Personal Assistance Package.

Unit- 17 Uses of the Internet Basic Services of Internet, WWW Browsers, Microsoft Internet Explorer (IE).

Unit- 18 Internet Explorer Keyboard Shortcuts, Cookies, Browser Terms in Netscape Navigator and Internet Explorer.

Reference Books:

1. Introduction To Computers By Subramanian
2. Peter Norton's Introduction To Computers By Norton, Peter
4. Pc Software Made Simple By Taxali, Ravi Kant

DCA102 : Communication Skills in English

Section– 1 Introduction

Unit- 1 Sentence, Kinds of Sentences , Positive , Negative.

Unit- 2 Statement , Interrogative , Exclamatory.

Section– 2 BASIC GRAMMAR

Unit- 3 Introduction, Subject Verb Agreement, Articles, Countable and Uncountable Nouns.

Unit- 4 Countable Nouns, Uncountable Nouns, Nouns Used as Countable as well as Uncountable.

Unit- 5 Writing Names with and without "the", Concepts of Vocabulary Building.

Unit- 6 Simple Rules for Pronunciation and Intonation, Prepositions.

Section- 3 TENSES

Unit- 7 Present Tense-Types, Past Tense-Types, Future Tense, Modal Auxiliary Verbs:Could , Would

Section- 4 DEBATES and GROUP DISCUSSION

Unit- 8 Debates, Types of Debates, Rules for Debate ,Advantages of Debate , Disadvantage.

Unit- 9 Group Discussion, Technique of Group Discussions, Qualities Needed for Group Discussion, Strategies for Group Discussions: Do's and Don'ts, Role Playing.

Section- 5 WRITING SKILLS

Unit- 10 Paragraph and Précis writing, Business Report Writing, Resume Writing, Essay Writing, Script Writing, Business Correspondence.

Section- 6 CONNVERSATION-FACE TO FACE

Unit- 11 Formal Conversation, Informal Conversation.

Reference Books:

1. English Grammar By Thomson and Martinet
2. Essays by Samuel Smiles
3. Write Better , Read Better : Reader's Digest Publication

DCA103 Programming in C

Section- 1 Origin and Introduction

Units- 1 Programming languages About C, Evolution of C, Structure of a C Program, Compilers & Interpreters Compiling a C Program, Pseudo Codes, A Simple C Program.

Section- 2 Data Types, Variables and Constants

Unit- 2 Data Types Variables, Constants Operators, Type Modifiers and Expressions Operators Type Modifiers Expressions Type Definitions Using 'typedef'. Introduction to Input / Output Console I/O Functions Unformatted Console I/O Functions.

Section- 3 Control Constructs

Unit- 3 Control Statements, Conditional Statements, Loops in C The break Statement, The Continue Statement.

Section- 4 Arrays

Unit- 4 Introduction to Arrays One Dimensional Array Strings Two Dimensional, Array Multi-dimensional Array.

Section- 5 Functions

Unit- 5 Introduction to Functions, Function Declaration and Prototypes, Storage Classes Recursion in Function.

Section- 6 Pointers

Unit-6 Introduction to Pointers, Pointer Notation, Pointer Declaration and Initialization, Accessing Variable through Pointer, Pointer Expressions.

Unit-7 Pointers and One Dimensional Arrays, Arrays of Pointers, Pointer to Pointers, Pointers and Functions.

Section- 7 Structures and Unions

Unit- 8 Structure Definition, Structure Initialization, Arrays of Structures, Arrays within Structures, Structures within Structures, Passing Structures to Functions.

Unit- 9 Structure Pointers, Union–Definition and Declaration, Accessing a Union Member, Initialization of a Union Variable, Use of User Defined Type Declarations.

Section- 8 Linked List

Unit- 10 Dynamic Memory Allocation, Linked List, Basic List Operations.

Section- 9 File Handling in C

Unit- 11 What is a File, Defining and Opening a File, Functions for Random Access to Files.

Reference Books:

1. Programming in C By Stephen G. Kochan
2. Programming in C By M.T.Somashekara
3. Let Us C By Yashwant Kanitkar

DCA104 Data Structures

Section- 1 INTRODUCTION TO DATA STRUCTURES

Unit- 1 Basic Concepts, Algorithms, Notations, Data Structure operations.

Unit- 2 Implementations of Data Structures, Pseudo-code for Algorithms.

Unit- 3 Mathematical Notations , Functions and Procedure

Section- 2 ARRAYS

Unit- 4 Definitions, Array, Index or Subscript, Dimensions of an Array.

Unit- 5 Memory Allocation to Arrays, Memory Allocation to One-dimensional Array.

Unit- 6 Memory Representation of Two Dimensional Arrays.

Unit- 7	Memory Allocation to Three Dimensional Array, Memory Allocation to Multidimensional Array.
Unit- 8	Static and Dynamic Variables, Pointer Type Variables, Pointers in Pascal.
Unit- 9	Pointers in C, Static and Dynamic Memory Allocation.
Section- 3	LINKED LISTS
Unit- 10	Dynamic Allocation of Memory, Representation of Linked List, Implementation of Linked List.
Unit- 11	Insertion of a Node at the Beginning, Insertion of a Node at the End, Insertion of a Node after a Specified Node.
Unit- 12	Traversing the Entire Linked List, Deletion of a Node from Linked List, Concatenation of Linked Lists.
Unit- 13	Merging Linked Lists, Reversing of Linked List.
Unit- 14	Applications of Linked List, Doubly Linked Lists, Circular Linked List, Generalized List.
Section- 4	STACK And Queue
Unit- 15	Implementation of Stack, Array-based Implementation, Pointer-based Implementation, Applications of Stacks, Maze Problem.
Unit- 16	Evaluation of Expressions, Evaluating Postfix Expression.
Unit- 17	Simulating Recursive Function using Stack, Passing Arguments.
Unit- 18	Return from a Function, Simulation of Factorial, Proving Correctness of Parenthesis in an Expression.
Unit- 19	Queue Implementation, Array-based Implementation, Pointer-based Implementation, Applications of Queues, Priority Queues.
Section- 5	Trees and Graphs
Unit- 20	Trees, N-ary Tree, Linked Tree Representation, Binary Tree Traversal, Searching a Binary Tree, Heap Tree, AVL Trees, Threaded Trees, Splay Trees, B-Trees.
Section- 6	Searching and Sorting
Unit- 21	Linear or Sequential Search, Binary Search, Tree Searching, Breadth First Search (BFS), Depth First Search (DFS), General Search Trees, Hashing.
Section- 7	GARBAGE COLLECTION AND COMPACTION, DYNAMIC MEMORY ALLOCATION
Unit- 22	Reference Counting Garbage Collection,, When Objects Refer to Other Objects, Why Reference Counting Does Not Work, Mark-and-Sweep Garbage Collection.

Unit- 23 The Fragmentation Problem, Stop-and-Copy Garbage Collection, The Copy Algorithm, Mark-and-Compact Garbage Collection.

Unit- 24 The Heap, Singly Linked Free storage, Doubly Linked Free storage, Buddy System for Storage Management.

Reference Books:

1. Purely functional data structures By Chris Okasaki
2. Algorithms and Data Structures :the science of computing by Chris Okasaki
3. Data Structures and Algorithms Bu Alfred V.Aho and Jeffrey D.Ullman

Semester II

DCA201 Mathematics

Section- 1 Set Theory

Unit- 1 Sets, Relations and Functions

Unit- 2 The Concept of a Set Notations and Representation of a Set Types of Sets Theorem on Subsets,

Unit- 3 Venn Diagram Set Operations De-Morgan's Laws Applications of Venn Diagrams Ordered Pairs, Relations & Functions

Section- 2 Graph Theory

Unit- 4 Graphs, Application of Graph Theory.

Unit- 5 Trees, Application of Trees.

Section- 3 Introduction To Recurrence Relations

Unit- 6 A sequence, Recurrence relation.

Unit- 7 Solving a recurrence relation, Characteristics equations.

Section- 4 Introduction To Propositional

Unit- 8 Calculus Logic, Conditional Propositions.

Unit- 9 Quantifiers, Applications of Logic.

Section- 5 Boolean Algebra & Its Applications Introduction

Unit- 10 Boolean Expressions and Boolean Functions.

Unit- 11 Identities of Boolean Algebra Duality, Algebra of Switching Circuits

Reference Books:
1. Schaum's Outlines of Discrete Mathematics By Seymour Lipschutz, Marc Lipson
2. Mathematics for Computer Science. Eric Lehman and Tom Leighton

DCA202 : Computer Organization and Architecture

Section- 1	Introduction
Unit- 1	Computer System, Components of a Computer System.
Unit- 2	Computer Organization, Data Representation, Performance Factors
Section- 2	Central Processing Unit
Unit- 3	Introduction, General Register Organization.
Unit- 4	Stack Organization, Instruction Formats.
Unit- 5	Addressing Modes, Program Control.
Unit- 6	Program Interrupt.
Section- 3	Control Unit
Unit- 7	Introduction, Control Memory.
Unit- 8	Microprogramming, Computer Configuration,
Unit- 9	Design of Control Unit, Overview of RISC/CISC
Section- 4	Memory Organization
Unit- 10	Memory Hierarchy, Main Memory or Primary Memory,
Unit- 11	Design of Main Memory, Auxiliary Memory ,Virtual Memory.
Unit- 12	Memory Management ,Associative Memory
Section- 5	Input-Output Devices
Unit- 13	Introduction, Peripheral , Asynchronous Communication,
Unit- 14	Asynchronous Serial Transfer, Asynchronous Communication Interface,
Unit- 15	Synchronous Communication, Character-Oriented Protocol,

Unit- 16 Input-Output Interface, Modes of Data Transfer, Interrupt , Multiple Interrupts ,Direct Memory Access (DMA)

Section- 6 Hardware Interfacing Issues

Unit- 17 Introduction, I/O Processing, Bus Interface, I/O versus Memory Bus,

Unit- 18 Data Transfer Techniques, Mode of Transfer, Software Routines,

Unit- 19 Direct Memory Access (DMA), Input-output Processor (IOP), CPU-IOP Communication, Channel

Reference Books:
1. Computer organization and architecture by William Stallings
2. Essentials of Computer Organization and Architecture, Second Edition by Linda Null and Julia Lobur

DCA203 DBMS

Section- 1 Introduction to Databases

Unit- 1 Database and its Hierarchies.

Unit- 2 History of Databases, Types of DBMS

Section- 2 Database Environment

Unit- 3 Database and DBMS Software, Database Architectural,

Unit- 4 Three Layered Architectural I/O Functions, Characteristics of Database Approach

Section- 3 Relational Model

Unit- 5 Logical Data Models, Relational Data Model,

Unit- 6 Querying Relational Data, Relational Algebra, Relational Calculus

Section- 4 SQL: Data Manipulation, Data Definition

Unit- 7 SQL Language, SQL Database Objects.

Unit- 8 SQL Data Types, DDL, DML and TCL Commands, Retrieving Data, Inserting Data, Updating Data, Deleting Data.

Unit- 9 Creating and Altering Tables, Views, Sequence, Index.

Section- 5 Database Planning, Design And Administration

Unit- 10 Database Application Life-cycle, Alternate System Development Methodologies,

Unit- 11 Database Planning, System Definition, Requirements Collections and Analysis,

Unit- 12 Database Design, DBMS Selection, Application Design, Database Administration

Section- 6 Entity Relationship Modeling, Normalization

Unit- 13 Database Design, Entity, Attributes and Entity Sets,

Unit- 14 Relationships and Relationship Sets, ER Diagrams, Additional Features of ER Model,

Unit- 15 Conceptual Database Design with the ER Model, Anomalies in Databases, Redundancy,

Unit- 16 Inconsistency, Update Anomalies, Good Database Designing, First Normal Form (1NF),

Unit- 17 Second Normal Form (2NF), Third Normal Form (3NF), Boyce-Codd Normal Form, Fourth Normal Form (4NF)

Section- 7 Database Security

Unit- 18 Access Control, Discretionary Access Control,

Unit- 19 Mandatory Access Control, Additional Issues to Security

Reference Books:
1. Database design for mere mortals. Hernandez
2. Database management by Watson

DCA204 OOPS with C++

Section- 1 Classes And Objects

Unit- 1 Introduction, Class , Object , Nature of Class.

Unit- 2 Types of Relationships, "Kind of" Relationship, "Is a" Relationship, "Has a" Relationship/Part of Relationship.

Unit- 3 Classification of Classes, Abstraction.

Section 2 Constructors And Destructors And Operators Overloading

Unit- 4 Introduction, Constructors, Destructors.

Unit- 5 Introduction-Operators Overloading, Example, Type Conversion

Section 3 Inheritance, Polymorphism And Virtual Functions]

Unit- 6 Introduction- Inheritance, Type of Inheritance.

Unit- 7 Introduction- Polymorphism, Virtual Functions.

Unit- 8 Need for Virtual Functions, Rules for Virtual Functions.

Section 4 File Handling

Unit- 9 Introduction, files, Stream Input/Output, Buffering and Flush,

Unit- 10 Exception Handling, String Handling, Sequential Fixed Length Structure.

Unit- 11 Linked List Fixed Size Nodes, Strings Manipulations,

Unit- 12 Character String Output Functions , String Handling Functions Postfix Expression, Simulating.

Section- 5 Arrays

Unit- 13 Introduction, Arrays, Array Declaration.

Unit- 14 Important Points about Arrays , Multidimensional Arrays.

Reference Books:

1. Object Oriented Programming With C++ - E Balagurusamy
2. Object Oriented Programming Using C++, Sanjeev Sofat, Cyber Tech. Publication