

DIPLOMA IN COMPUTER APPLICATION (DCA)
(As per credit system effective system)

R-784 (a) The following shall be the scheme of examination

FIRST SEMESTER

Paper No	Title	Weekly		Credit		Marks Theory	Marks Sessional or Practical		Total Marks	Duration Theory Exam
		Th	Pr	Th	Pr		S	Pr		
I	ICT Tools	3	4	3	2	60		40	100	2 Hrs
II	Computer Organisation & Architecture	5	-	5	-	60	40	-	100	2 Hrs
III	C Programming	3	4	3	2	60	-	40	100	2 Hrs
IV	Operating Systems	3	4	3	2	60	-	40	100	2 Hrs
V	Soft Skills Development	5	-	5	-	60	40	-	100	2 Hrs
	Total	19	12	19	+ 6 = 25	300	80	120	500	--

SECOND SEMESTER

Paper No	Title	Weekly		Credit		Marks Theory	Marks Sessional or Practical		Total Marks	Duration Theory Exam
		Th	Pr	Th	Pr		S	Pr		
VI	OOPS using C++	3	4	3	2	60	-	40	100	2 Hrs
VII	Management Process & OB	5	-	5	-	60	40	-	100	2 Hrs
VIII	Data Structure using Java	3	4	3	2	60	-	40	100	2 Hrs
IX	Database Management Systems	3	4	3	2	60	-	40	100	2 Hrs
X	Project		6		3	-		100	100	-
	Total	14	18	14	+ 9 = 23	240	40	220	500	--

Total Credits for Diploma (25 + 23) = 48

784 (b) The sessional marks assigned by institute/ college to the student shall be subject to the scaling down . The scanling down shall be done in relation to the theory marks. A variation $\pm 10\%$ is permitted.

(c) The university will appoint external examiner to assess the project. Both the examiners internal guide and external examiner shall assess the project report separately. On the basis of the following criteria:-

1. Project Preparation 50 Marks
2. Presentation 25 Marks
3. Viva Voce 25 Marks

Both the examiners shall submit the marks lists to the university separately. The average of both the examiners shall be taken as the marks obtained by the student in the project. The scaling down will not be applicable to the project marks.

PAPER I -- INFORMATION COMMUNICATION TECHNOLOGY(ICT) TOOLS

Theory	60
Practical	40
Credit	5

Unit I - ICT Fundamentals- Historical development –

Computer Programming Languages Classification, machine code, assembly language, higher lever languages, Single user, multi-user, work station, client server systems, Computer networks, network protocols, LAN,WAN, Internet facilities through WWW, Mosiac,Gopher, html and its elements

Unit II - **Word:** Creating word documents, menu, office assistant working with files , editing text, saving, printing , undo, redo, spelling, formatting, ruler, selecting, cutting, copying, numbering, bullets, page, orientation, margins, tables in a document, formatting text in table, addition deletion of rows columns, record handling, sorting, label, & envelop, using forms, Recycle bin. Protection of documents, mail merge.

Unit III - **Excel:** Excel Sheet creation, entering data, layout and formatting of sheet preview & print, working with range, rows, columns, total, sorting using formatting toolbars, format cells, cell content moving & coping grouped & ungrouped worksheet alignment of text, border colors, page setup, chart, types of chart merging sizing printing chart objects, formatting charts, formula palette , functions & uses - Analysing data with excel.

4. **Power Point:** Creating a presentation, modifying visual elements, adding objects, applying transition, animation and linking, preparing layouts, presenting a slide show.

Practicals:

Familiarizing with DOS commands, Windows operating systems.

Creating Documents inMSWORD

Creating worksheets in MSEXCEL

Developing Presentations with Power Point

Web Page development in FRONT PAGE

Books:-

1. Courter Marquis - Office - 2000
2. Mansfield - MS- Office
3. Sanders - Computer Fundamentals
3. Syber Publication - Office- 2000 Complete

PAPER II - COMPUTER ORGANIZATION AND ARCHITECTURE.

Theory	60
Sessional	40
Credit	5

Principles of Computer design – software, hardware interaction layers in computer architecture. Central processing unit. Machine language instructions, Addressing modes, instruction types, instruction set selection, Instruction cycle and execution cycle.

Control unit, Data path and control path design, Microprogramming Vs hardwired control RISC Vs CISC, Pipelining in CPU designee Superscalar processors.

Memory system, Storage technologic, Memory array organization, Memory hierarchy, interleaving, cache and virtual memories and architectural aids to implement these.

Input- Output devices and characteristics.

Input-output processing, bus interface, data transfer techniques, I/O interrupts, channels performance evaluation – SPEC marks, Transaction Processing benchmarks.

Books:-

Mano, M, "Computer System and Architecture" (3rd edition) Prentice Hall of India, New Delhi, 1994

Pal Chauduri, p., "Computer Organisation and Design", Prentice Hall of India, New Delhi, 1994.

Rajraman V., and Radhakrishnan, T., "Introduction to Digital Computer Designee" (4th edition), Prentice Hall of India, New Delhi, 1997.

Stalling, W., "Computer Organization and Architecture. (2nd edition) Prentice Hall of India, New Delhi.

PAPER III - C PROGRAMMING

Theory	60
Practical	40
Credit	5

1. C Language – Character set Tokens of C - tokens-constant-keywords and identifiers - variables- data types- declaration and assignment of variables- defining symbolic constants.- Operators and Expressions:
Types of Operators- Arithmetic, Relational and Logical Operators Assignment, increment and decrement of operators - conditional bitwise and special operators - arithmetic expression and its evaluation - hierarchy of arithmetic operations - evaluations, precedence and associativity - mathematical functions.
2. Control Branching and Decision-Making in C - If statement Switch statement - GOTO statement - The ?: Operators.-
3. Decision - Making and Looping nesting in a loop, statements in C WHILE DO, and FOR statements with variations.
4. Arrays in C Single Two - dimensional and Multi-dimensional arrays.
5. Handling of Character Set: Declaration & Initialization of string variables - reading from and writing to screen -Arithmetic operations - String handling functions.
6. Structures and Unions:
Definitions initialization and assigning values to members arrays of structures and arrays within structures structure with in structure- unions - size of structures.
7. Pointers:
Declaration and initialisation of pointers - pointer expression - pointer and arrays - pointer and character strings pointers and functions - pointers and structures pointer on pointers.
8. File Maintenance in “C” :
Defining, Opening and closing a file - Input/Output operations on a file- random access to file - command line arguments.
9. User Defined Functions:
Form of “C” functions- calling a function - nesting of functions - recursion - functions with arrays.

Practicals:

Writing Programs in C for various applications.

File Handling Programs in C

Books:

1. Programming in “C” E Balgurusamy Tata Cm Graw-Hill
2. The “C” Programming Language :Briain W. Kenigham & Dennis Ritchie
3. The Spirit of “C”- Henry Mulish, Herbert L. Cooper.
4. Mastering “C” - Crain Bolon.

Paper IV - Operating Systems

Theory	60
Practical	40
Credit	5

Introduction

Evolution of operating systems. Types of operating systems. Different Views of the operating systems, operating system concepts and structure.

Processes

The Process concept, systems programmer's view of processes. The operating system services for process management, Scheduling algorithms. Performance evaluation.

Memory Management

Memory Management without swapping of paging, swapping, virtual memory page replacement algorithms, modeling paging algorithms, design issues for paging systems, segmentation.

Inter-process Communication and Synchronization.

The need for interprocess synchronization, mutual exclusion., semaphores, hardware support for mutual exclusion, queuing implementation of semaphores, classical problems in concern programming critical region and conditional critical region, monitors, messages deadlocks.

File Systems.

File systems, directories, file systems implementation, security protection mechanism.

Input/Output

Principles of I/O Hardware: I/O devices, device controllers direct memory access.

Principles of I/O Software: Goals, interrupt handlers, device drivers, device independent I/O software, User space I/O software.

Disks. Disk hardware, scheduling algorithms, Error handling, track-at-a-time caching, RAM Disk.

Clocks: Clock hardware, memory mapped terminals, I/O software.

Terminals: Terminal hardware memory mapped terminals, I/O software.

Processes and Processors in Distributed Systems: Threaded, system models, processor allocation scheduling.

Distributed File Systems: Design, implementation, and trends.
Performance Measurement, monitoring and evaluation

Introduction, important trends affecting performance issue, why performance monitoring and evaluation are needed, performance measures, evaluation techniques, bottlenecks and saturation, feedback loops.

Case Studies : MS, DOS,MS WINDOWS, LINUX(UNIX) operating systems.

Practicals:- Commands and Shell of MS DOS, WINDOWS, LINUX / UNIX

Books:

Deitel H.M., “An Introduction to Operating system”. Addison Wesley Publishing Company 1984.

Milenkovic, M., “Operating Systems – concepts and Design”, McGraw Hill International Edition Computer Science Series 1992.

Peterson, J.L. Abraham Silberschatz. “ Operating System Concepts “ Addison Wesley publishing Company 1989.

Tanenbaum, A.s. “Modern Operating System”, Prentice Hall of India Pvt. Ltd. 1995.

PAPER V - SOFT SKILL DEVELOPMENT

Theory	60
Sessional	40
Credit	5

1. Self Development and Assessment, Self-Assessment- Self-Awareness, Perception and Attitudes, Values and Belief System,

Personal Goal Setting, Career Planning, Self-Esteem, Building of Self-Confidence

2 Components of communication,

Principles of communication, barriers, listening skills, Verbal Communication, Includes Planning, Preparation, Delivery,

Feedback and Assessment of activities like Public speaking

Group Discussion, Oral Presentation skills, Perfect Interview

Listening and observation skills, Body language, Use of Presentation graphics, Use of Presentation aids, Study of communication.

3. Written Communication, Technical Writing–Technical Reports

Project Proposals, Brochures, Newsletters, Technical Articles

Technical Manuals, Official/Business Correspondence- Business letters, Memos, Progress report, Minutes of meeting, Event reporting,

Use of style, Grammar and Vocabulary for effective technical writing,

Use of: Tools, Guidelines for technical writing, Publishing Ethics and Etiquettes, Business Ethics, Etiquettes in social as well as

Office settings, Email etiquettes, Telephone Etiquettes, Engineering ethics and ethics as an IT professional, Civic Sense

4. Other Skills- Managing time, Meditation, Understanding roles of

Engineer and their Responsibility, Exposure to work environment And culture in today's job Places, Improving Personal Memory,

Study skills that include Rapid reading, Notes taking, Complex problem solving, creativity.

Books & Study Material:

1. You Can Win – Shiv Khera – Macmillan Books – 2003 Revised Edition
2. 7 Habits of Highly effective people – Stephen Covey
3. Business Communication? Asha Kaul
4. Business Communication - M. Balasubramanyam
5. John Collin, “Perfect Presentation”, Video Arts MARSHAL
6. Jenny Rogers “ Effective Interviews”, Video Arts MARSHAL
7. Raman Sharma, “ Technical Communications”, OXFORD
8. Sharon Gerson, Steven Gerson “Technical writing process and product”, Pearson Education Asia, LPE third edition.
9. R. Sharma, K. Mohan, Business correspondence and report writing”, TAG McGraw Hill ISBN 0-07-044555-9
10. 6. Video for technical education catalog, National education and Information Films Ltd. Mumbai.
11. Management training and development catalog, National education and Information Films Ltd. Mumbai.
12. XEBEC, “Presentation Book 1,2,3”, Tata McGraw-Hill, 2000,ISBN 0-40221-3
13. Tim Hindle, “Reducing Stress”, Essential Manager series Dk Publishing
14. Sheila Cameron, “Business student Handbook”, Pitman Publishing
15. Dr. R. L. Bhatia, “ Managing time for competitive edge”
16. Lorayne Lucas “Memory Book”
17. Robert Heller, “Effective leadership”, Essential Manager series Dk Publishing
18. Newstrom Keith Davis,” Organizational Behavior”, Tata McGraw-Hill, 0-07-.

PAPER VI - OBJECT ORIENTED PROGRAMMING USING C++

Theory	60
Practical	40
Credit	5

Introduction of OOPS, Procedural Vs Object Oriented Programming

Classes, Object, Data Abstraction, Encapsulation, Inheritance, Polymorphism, Dynamic Binding, Message Passing, Object Oriented Languages, Basics of C++ - History of C & C++, V C++

C++ Program Structure, Application of C++ Structure & Class

Compiling & Linking- C++ Expression, C++ Tokens, Keywords, Identifiers & Constants, Basic Data Types, User-Defined Data Types,

Symbolic Constant, Type Compatibility, Reference Variables, Operator in C++, Scope Resolution Operator, Member De-referencing Operators, Memory Management Operators,

Manipulators, Type Cast Operator

Functions In C++, Main Function, Function Prototyping, Call by Reference, Call by Address, Call by Value, Return by Reference

Inline Function, Default Arguments, Const Arguments, Function Overloading, Friend Function

Classes & Object - C++ Program with class Defining Member Functions, Making an Outside Function Inline, Nesting of Member Functions, Private Member Functions

Arrays within a Class- Memory Allocation for Objects

Static Data Members, Static Member Functions, Arrays of Objects

Object as Function Arguments, Friendly Functions, Returning Objects, Const member functions, Pointer to Members, Local Classes

Constructor & Destructor- Parameterized Constructor Multiple Constructor in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructor, Const Object, Destructor

Operator Overloading & Type Conversion- Defining operator Overloading Overloading Unary Operator Overloading Binary Operator, Overloading Binary Operator Using Friends, Manipulating of String Using Operators, Type Conversion, Rules for Overloading Operators

Inheritance - Defining Derived Classes, Single Inheritance, Making a Private Member Inheritable, Multilevel Inheritance, Hierarchical Inheritance, Multiple Inheritance,

Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructor in Derived Classes, Nesting of Classes

Pointer, Virtual Function & Polymorphism, Introduction, Pointer to Object, Pointer to Derived Class, Virtual Function, Pure Virtual Function,

C++ I/O System Basics- C++ Streams, C++ Stream Classes, Unformatted I/O Operation, Formatted I/O Operation, Managing Output with Manipulators

Working with Files – Introduction, Classes for File Stream Operation

Opening & Closing Files, Detection of End of File, More about Open(): File modes, File pointer & manipulator, Sequential Input & output Operation, Updating a File : Random Access, Command Line Arguments

Template- Generic Function, A function with Two Generic Data Types, Explicitly Overloading a Generic Function, Overloading a Function Template, Using Standard Parameter with Template

Functions, Generic Function Restriction, Applying Generic Function : Generic Sort, Generic Classes, An Example with Two Generic Data Types, Using Non-Type Arguments with Generic Class, Using Default Arguments With Template Classes, Explicit Class, Specification,

Exception handling - Exception Handling Fundamentals

The try Block, the catch Exception Handler The throw Statements

The try/throw/catch sequence Exception Specification Unexpected Exception Catch – All Exception Handlers Throwing an exception from handler Uncaught Exception

Introduction to Standard Template Library- STL Programming Model, Sequence, Container Adapter, Integrator, Algorithms, Predicates, Allocators

Books:

- 1.C++: The Complete Reference Herbert Schildt
- 2.Let us C++ Yeshwant Kanetkar
- 3.Object Oriented Programming with C++ E. Balagurusamy
- 4.C++ Primer Stanley Lippman & Lajoi
- 5.C++ Programming Language Bjarne Stroustrup
- 6.C++ Programming Bible Al Stevens & Clayton Walnut

PAPER VII - MANAGEMENT PROCESS & ORGANISATIONAL BEHAVIOUR

Theory	60
Sessional	40
Credit	5

Introduction of management , Evolution of management thought, Systems and contingency approach for understanding organizations, managerial processes, functions, skills and roles in an organization; Social Responsibility of Business; Understanding and Managing Individual behaviour- Personality, Perceptions, Values, Attitudes, Learning, Work motivation, Individual decision making and problem solving; Understanding and managing group processes-Interpersonal and group dynamics applications of emotional intelligence in organizations, communication, group decision making, Leadership and influence process; Understanding and Managing organizational system-Organizational design and structure, Work stress.

BOOKS:

1. Koonz, H. and Weachirch, H. *Management*. 10th ed., New York, McGraw Hill, 1995.
 2. Luthans, F. *Organizational Behaviour*, 7th ed., New York, McGraw Hill, 1995.
 3. Robbins, S.P. *Management*, 5th ed., New Jersey, Englewood Cliffs, Prentice Hall Inc., 1996.
 4. Robbins, S.P. *Organizational Behaviour*, 7th ed., New Delhi, Prentice hall of India, 1996
 5. Singh, Dalip *Emotional Intelligence at work, Response Books*, Sage Publications, Delhi, 2001.
 6. Staw, B.M. *Psychological Dimensions of Organizational Behaviour*. 2nd Ed., Englowd Cliffs, New Jersey, Prentice Hall Inc. 1995.
- Stoner, J. etc. *Management* 6th Ed., New Delhi, Prentice Hall of India, 1996.

PAPER VIII - DATA STRUCTURE USING JAVA

Theory	60
Practical	40
Credit	5

Introduction of Data Structures, Types and classification, Linear and Non Linear Structures,.

Arrays, Linear Linked List, Operations of Traversing, insertion and deletion of nodes.

Stack Traversing- PUSH and POP operations

Queue Structures – Traversal – Insertion and Deletion operations in a QUEUE

Non Linear Structures – Trees and Graph- Binary Tree Traversing, Binary Search Trees- AVL Trees - Path Cycle adjacency, Graph representation, Graph searching

Sorting and Searching operations in different structures.

Algorithms for various operations of Data Structures are to be designed and implemented in JAVA.

Books:

Thomas A Standish – Data Structure in JAVA

Anastas Misev - Data Structure & Algorithm using JAVA

PAPER IX DATABASE MANAGEMENT SYSTEM

Theory	60
Practical	40
Credit	5

1. Database Management System- Basic concepts, Data base & Database users
Characteristics of Database, Database systems, concepts and architecture
Date Models, Schemas & Instances DBMS Architecture & data independence
Data base languages & Interfaces, Data modeling using the entity-relationship approach
2. Relational Model, Languages & Systems, Relational data model & Relational Algebra
Relational Model Concepts
Relational Model Constraints
Relational Algebra
SQL – A Relational Data base language
Date Definition in SQL
View & queries in SQL
Specifying constraints & indexes in SQL
Specifying constraints & indexes in SQL
A relational database management systems
ORACLE / INGRES
3. Conventional data models & systems
Network Data model & IDMS systems
Membership types and options in a set
DML for network model
Navigation within a network database
Hierarchical Data model & IMS system
Hierarchical Database structure
HSAM, HISM, HDAM & HIDAM organization
DML for Hierarchical model
Overview of IMS
4. Relational database design
Function Dependencies & normalization for relational Databases

Function Dependencies
Normal forms based on primary keys
(1NF,2NF,3NF & BCNF)
Lossless join & dependency preserving decomposition

5. Concurrency control & Recovery Techniques
 - Concurrency control Techniques
 - Locking Techniques
 - Time stamp ordering
 - Granularity of data items
 - Recovery Techniques
 - Recovery concepts
 - Database backup and recovery from catastrophic failures
6. Concepts of object oriented data base management systems

Books :

Date , C.J. "An introduction to database systems", Narosa Publishing House, New Dehli

Desai, B. "An introduction to database concepts", Galgotia publications, New Dehli

Elmsari and cavathe, "fundamental of database systems ", addison wesley, New York

Ullamn, J.D. "principles of database systems", Galgotia publications, New Dehli

PAPER X - PROJECT

Marks 100

Credit 3

Each student has to complete a project in second semester. The project will be assigned by the internal guide from the institute. As far as possible individual projects are to allotted to students. However, in case of larger project two or three student work in group. In such a case each student should work on a separate or distinct module. Student should submit the project individually. The project report submitted by the student shall be evaluated separately by the internal guide and the external examiner appointed by the university. Project work may be carried out in the institution or outside with prior permission of the institute.