



**RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL
DIPLOMA IN COMPUTER SCIENCE & ENGINEERING**

SEMESTER: **THIRD**
COURSE CODE: **301**
NAME OF COURSE: **COMPUTER ARCHITECTURE**

SCHEME: Jul.09
PAPER CODE: **6344**

COMMON WITH PROGRAM (S): COMPUTER HARDWARE & MAINTENANCE

RATIONALE

Diploma in Computer Hardware & maintenance. have to be conversant with computer, its terminology and functioning. Computer architecture is concerned with the structure and behavior of the various functional modules of the computer and their interaction, the course provides the necessary understanding of the hardware operation of digital computers..



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SCHEME: Jul.09
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COMMON WITH PROGRAM (S): COMPUTER HARDWARE & MAINTENANCE

SCHEME OF STUDIES AND SPECIFICATION TABLE

Lectures: 5 Hrs. per week

SCHEME OF STUDIES

| Sr. No. | TOPICS | THEORY (HRS) |
|----------------|--|-------------------------|
| 1. | Computer Architecture | 10 |
| 2. | Basic Computer Organization And Design | 10 |
| 3. | Central Processing Unit | 15 |
| 4. | Input Output Organization | 15 |
| 5. | Memory Organization | 14 |
| 6. | Advance Processor Architectures | 11 |
| | TOTAL | 75 |



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COMMON WITH PROGRAM (S): **COMPUTER HARDWARE & MAINTENANCE**

COURSE CONTENT

Lectures: **5 Hrs.** per week

| Sr. No. | COURSE CONTENT | Hours of study |
|----------------|--|-----------------------|
| 1 | <p>COMPUTER ARCHITECTURE</p> <p>Register Transfer and Micro operations, Register Transfer: Bus and Memory Transfers.</p> <p>Three-State Bus Buffers, Memory Transfer.</p> <p>Arithmetic Micro operations: Binary Adder, Binary Adder Subtractor, Half Adder and Full Adder Binary Incrementer.</p> <p>Arithmetic Circuit, Logic Micro operations: List of Logic Micro operations, Hardware, Implementation.</p> <p>Shift Micro-operations: Hardware Implementation</p> | 10 |
| 2 | <p>BASIC COMPUTER ORGANIZATION AND DESIGN</p> <p>Instruction Codes: Stored Program Organization, Indirect Address Computer Registers: Common Bus System, Computer Instruction: Instruction Set Completeness Timing and Control</p> <p>Instruction Cycle: Fetch and Decode, Type of Instruction, Register-Reference Instructions Memory-Reference Instructions: AND to AC, ADD to AC, Load to AC, Store to AC,</p> <p>Branch Unconditionally, Branch and Save Return Address, ISZ, Control Flowchart Input-Output Configuration, Input-Output Instructions, Program Interrupt, Interrupt Cycle</p> <p>Complete Computer Description, Design of Basic Computer: Control Logic Gates, Control of Registers and Memory, Control of Single flip-flops, Control of Common Bus</p> <p>Design of Accumulator Logic: Control of AC Register, Adder and Logic Circuit, Character Manipulation, Program Interrupt.</p> | 10 |



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NAME OF COURSE: **COMPUTER ARCHITECTURE**
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Lectures: **5 Hrs.** per week

| | | |
|----------|--|-----------|
| 3 | CENTRAL PROCESSING UNIT Introduction General Register Organization: Control Word Stack Organization: Register Stack, Memory Stack, Reverse Polish Notation, Evaluation of Arithmetic Expressions Instruction Formats: Three Address Instructions, Two Address Instructions, One Address Instructions, Zero Address Instructions, RISC Instructions Addressing Modes Data Transfer and Manipulation: Data Transfer Instructions, Data Manipulation Instructions, Arithmetic Instructions, Logical and Bit Manipulation Instructions, Shift Instructions Program Control: Status Bit Conditions, Conditional Branch Instructions Subroutine Call and Return, Program Interrupt, Types of Interrupts Reduced Instruction Set Computer (RISC): CISC Characteristics, RISC Characteristics, Overlapped Register Windows | 15 |
| 4 | INPUT OUTPUT ORGANIZATION Peripheral Devices: ASCII Alphanumeric Characters Input-Output Interface: I/O Bus and Interface Modules, I/O Versus Memory Bus, Isolated versus Memory-Mapped I/O Asynchronous Data Transfer: Strobe Control, Handshaking, Asynchronous Serial Transfer, Asynchronous Communication Interface First-In, First-Out, Buffer Modes of Transfer: Interrupt-Initiated I/O, Software Considerations Priority Interrupt: Daisy-Chaining Priority, Parallel Priority Interrupt, Priority Encoder, Software Routines, Direct Memory Access (DMA): DMA Controller, DMA Transfer Input-Output Processor: CPU-IOP Communication Serial Communication: Character-Oriented Protocol, Data Transparency Bit-Oriented Protocol | 15 |



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COMMON WITH PROGRAM (S): **COMPUTER HARDWARE & MAINTENANCE**

Lectures: **5 Hrs.** per week

| | | |
|----------|---|-----------|
| 5 | MEMORY ORGANIZATION Memory Hierarchy Main Memory: RAM and ROM Chips, Memory Address Map, Memory Connection to CPU Auxiliary Memory: Magnetic Disks, Magnetic Tape, CD, DVD Associative Memory: Hardware Organization, Read Operation, Write Operation Cache Memory: Associative Mapping, Direct Mapping, Set-Associative Mapping, Writing into Cache, Cache Initialization Virtual Memory: Address Space and Memory Space, Address Mapping | 14 |
| 6 | Advance Processor Architectures Instruction Pipelining, Arithmetic Pipelining, Super Scalar Processors, VLIW Processors, Parallel Processing, Flynn's Classification of Parallel Processing, Vector Computers, Array Processors, Distributed Shared Memory Parallel Computers. Cluster of Workstations. | 11 |



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Lectures: **5 Hrs.** per week

BOOKS RECOMMENDED.

1. Computer Organization & Architecture by V. Rajaraman & T. Radha Krishnan, PHI Learning
2. Computer System Architecture by P.V.S. Rao, PHI Learning

REFERENCES

1. Morris Mano. M., Computer System Architecture, PHI Learning.
2. Tanenbaum, 5/e, Structured Computer Organisation, PHI Learning.
3. Hwang & Brigg, Advanced Computer Architecture, McGraw Hill .
4. Stallings, 4/e, Computer Organisation & Architecture.
5. Murdocca Computer Architecture & Organization Wiley India
6. ISRD group Computer Organization TMH
7. T.K. Ghosh, Computer Organisation & Architecture TMH



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DIPLOMA IN COMPUTER SCIENCE & ENGINEERING**

SEMESTER: THIRD
COURSE CODE: 302
NAME OF COURSE: OPERATING SYSTEM

SCHEME: Jul.09
PAPER CODE: 6345

COMMON WITH PROGRAM (S):

RATIONALE

The heart of a computer is based around its Operating System. The processor deals with request Coming from all directions asynchronously. The operating system has to deal with the problems of Contention, resource management and both program and user data management, and provide a Useful no-wait user interface. The concept of Operating System is discussed through case studies of UNIX, LINUX, Windows Vista & Windows XP. The course provides clear vision, understanding and working of Operating Systems.



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SEMESTER: **THIRD**

COURSE CODE: **302**

NAME OF COURSE: **OPERATING SYSTEM**

COMMON WITH PROGRAM (S): **COMPUTER HARDWARE & MAINTENANCE**

SCHEME: **Jul.09**

PAPER CODE: **6345**

SCHEME OF STUDIES AND SPECIFICATION TABLE

Lectures: **5Hrs.** per week

Practical: **2 Hrs.** per week

SCHEME OF STUDIES

| Sr. No. | TOPICS | THEORY (HRS) |
|----------------|----------------------------------|---------------------|
| 1. | Introduction to Operating System | 10 |
| 2. | Process Management | 20 |
| 3. | Memory Management | 15 |
| 4. | File System | 15 |
| 5. | Device Management | 10 |
| 6. | Protection & Security | 03 |
| 7. | Other Operation System | 02 |
| | TOTAL | 75 |

Note: Case studies of UNIX, LINUX and Windows Vista & Windows XP have been included in the respective chapter.



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SCHEME: **Jul.09**

COURSE CODE: **302**

PAPER CODE: **6345**

NAME OF COURSE: **OPERATING SYSTEM**

COMMON WITH PROGRAM (S): **COMPUTER HARDWARE & MAINTENANCE**

COURSE CONTENT

Lectures: 5 Hrs. per week

| Sr. No. | Course Content | Hours of study |
|----------------|--|-----------------------|
| 1. | INTRODUCTION TO OPERATING SYSTEM 1.1 Basics of Operating System, its functions, Objectives and Types of operating System 1.2 Introduction of time sharing, real time, Parallel and Distributed Multiprocessor embedded O.S. 1.3 Structure of Operating System:- System components, Operating System services, System calls and Programs, System Structure. | 10 |
| 2. | PROCESS MANAGEMENT 2.1 Concepts of Processes; Process state (state diagram), Process Scheduling & Process control block (PCB), Operation on Processes, Threads multiprocessor scheduler. 2.2 Process Scheduling & Algorithms- Basic Concepts, Scheduling criteria, Scheduling Algorithms- FCFS, SJF, Priority, RR, Multiple queues, Multiple processor Scheduling, Real time Scheduling. 2.3 Dead Locks - Basic Concept of deadlock, deadlock detection, deadlock prevention, deadlock Avoidance, recovery from deadlock & Banker's algorithm. | 20 |
| 3. | MEMORY MANAGEMENT 3.1 Concept of Memory Management- Logical v/s Physical address, Cache Memory, Swapping, Allocation Techniques (contiguous and Non-contiguous), Fragmentation & Compaction. 3.2 Concepts of paging and segmentation - Paged Segmentation & Segmented Paging. 3.3 Concepts of Virtual Memory- Demand Paging, Page Fault, Page replacement and its Algorithms, Allocation of frames, Thrashing. | 15 |



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COMMON WITH PROGRAM (S): **COMPUTER HARDWARE & MAINTENANCE**

| | | |
|-----------|---|-----------|
| 4. | FILE MANAGEMENT SYSTEM 4.1 File System interface: File Concepts, Types of Files, Access Methods, Directory Structure, File System mounting , Protection. 4.2 File System Implementation: File System Structure, Allocation Methods (Contiguous, Non Contiguous, index allocations), Free space Management (Fragmentation & compaction), Directory implementation, File- sharing, recovery, network file system, (NFS), Efficiency and performance. | 15 |
| 5. | DEVICE MANAGEMENT 5.1 Input Output System : I/O Hardware & Interface, Kernel I/O Sub System, I/O request streams. 5.2 Disk Management- Disk Structure, Disk Scheduling and its algorithms, RAID TECHNOLOGY. | 10 |
| 6. | PROTECTION AND SECURITY 6.1 Goal of Protection, Domain of Protection, Security Problems Authentication. | 03 |
| 7. | Other Operation System 7.1 Introduction to Network Operation System (Only Brief Concept). 7.2 Introduction to Distributed Operation System (Only Brief Concept). | 02 |



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LIST OF EXPERIMENTS

Practical: **2 Hrs. per Week**

| S.NO. | NAME OF EXPERIMENTS | HOURS OF STUDY |
|--------------|--|-----------------------|
| 1 | 1. BIOS Configuration 2. Installation of Various Operation System a. Windows Vista b. Windows XP c. Linux d. Unix | 10 |
| 2 | File Management Commands, Use of Administration Commands, System Calls | 5 |
| 3 | Simulation of CPU Scheduling Algorithms (FCFS, SJF, RR) | 5 |
| 4 | Simulation of Memory Allocation, Paging and fragmentation | 5 |
| 5 | Case study of UNIX, Linux, Windows Vista & Windows XP. | 5 |
| | TOTAL | 30 |



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REFERENCES

TEXT BOOKS

1. Galvin, Operating Systems, Wiley Eastern.
2. Godbole A.S Operating Systems, TMH New Delhi.
3. Pal Chaudhury, Operating system, Principals & Design PHI Learning

REFERENCE BOOKS

1. Bach M.J., Design of the UNIX Operating System, PHI
2. Milankovic, Operating Systems, TMH
3. Ray Dunkan Advance Dos Programming, BPB.
4. Donovons & Mendric, Operating Systems, TMH.
5. William stalling Operating System, pearson edu.



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DIPLOMA IN COMPUTER SCIENCE & ENGINEERING

SEMESTER: **Third**
COURSE CODE: **303**
NAME OF COURSE: **DATA COMMUNICATION**
COMMON WITH PROGRAM (S):

SCHEME: **Jul.09**
PAPER CODE:**6370**

RATIONALE

This course will allow students to develop background knowledge as well as core expertise in data communication technologies, which is one of the fastest growing industries. It forms an integral part of the modern Information and Communications Technology. Principles of DC play an important role in designing any modern telecom infrastructure.

A growth of telecommunications and networking is a dramatic increase in the number of professions, where an understanding of DCN is essential for success. Today, students wanting to understand the concepts and mechanisms underlying DCN infrastructures come from a variety of academic and professional backgrounds.

The students will be exposed to communication principles, different types of media, modulation techniques, multiplexing, switched networks, wireless communication, fibre-optic Communications and the state-of-art networking applications.

At the end of the course the students would know:

- Evolution of data communication and networking paradigms
- Principles of data communication, channel characteristics, signalling, modulation and encoding, and multiplexing
- Various transmission media, their comparative study, fibre optics and wireless media Categories and topologies of networks.
- Layered architecture of OSI .
- Channel error detection and correction.
- Emerging technologies, such as mobile telephony etc.



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SEMESTER: **Third**
COURSE CODE: **303**
NAME OF COURSE: **DATA COMMUNICATION**
COMMON WITH PROGRAM (S):

SCHEME: **Jul.09**
PAPER CODE: **6370**

SCHEME OF STUDIES

Lectures: **5 Hrs.** per week

SCHEME OF STUDIES

| Sr. No. | Topics | THEORY (HRS) |
|----------------|---|-------------------------|
| 1 | Data Communication Concept & Technology | 12 |
| 2 | Transmission Media | 10 |
| 3 | Modulation And Data Modems | 12 |
| 4 | Multiplexing, Spreading And Switching | 15 |
| 5 | Error Detection And Correction | 10 |
| 6 | Telephone And Cable Networks | 8 |
| 7 | Cellular And Satellite Networks | 8 |
| | | 75 |



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DIPLOMA IN COMPUTER SCIENCE & ENGINEERING

SEMESTER: **Third**
COURSE CODE: **303**
NAME OF COURSE: **DATA COMMUNICATION**
COMMON WITH PROGRAM (S):

SCHEME: **Jul.09**
PAPER CODE: **6370**

COURSE CONTENT

Lectures: **5 Hrs.** per week

| S.No. | Course Content | HOURS OF STUDY |
|--------------|--|-----------------------|
| 1 | DATA COMMUNICATION CONCEPT & TECHNOLOGY 1.1 Data Representation, Data Transmission. 1.2 Modes of Data Transmission- Analog Data, Digital Data, 1.3 Communication Channels, Synchronous & Asynchronous 1.4 Data & Communication, Series & Parallel data Communication, Bit rate and Baud rate, 1.5 Bandwidth & Channel Capacity, Nyquists and Shannon's theorems. | 12 |
| 2 | TRANSMISSION MEDIA 2.1 Transmission Line Characteristic, Liner Distortions, Crosstalk, Twisted Pairs Cable, Coaxial Cable, UTP, STP. 2.2 Optical Fibre – Multimode Fibres, Modal Dispersion, Mono Mode Fibre, Graded Index Fibres, Total Dispersion, Fibre Attenuation, Radio Media, UHF & Microwaves, Satellite Link, Equalization. | 10 |
| 3 | MODULATION AND DATA MODEMS 3.1 Concept of modulation and demodulation, 3.2 Digital modulation methods: PCM, Amplitude, 3.3 Shift-keying, Frequency Shift-keying, 3.4 Quadrature PSK (QPSK), Differential PSK (DPSK), Simplex, Half Duplex, Full Duplex | 12 |



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| | | |
|----------|---|-----------|
| 4 | Multiplexing, Spreading and Switching 4.1 MULTIPLEXING: Frequency-Division Multiplexing, Wavelength-Division Multiplexing, Synchronous Time-Division Multiplexing, Statistical Time-Division Multiplexing, 4.2 SPREAD SPECTRUM: Frequency Hopping Spread Spectrum (FHSS), Direct Sequence Spread Spectrum. 4.3 CHANNELIZATION: Frequency-Division Multiple Access (FDMA), Time-Division Multiple Access (TDMA), Code-Division Multiple Access (CDMA). 4.4 CIRCUIT-SWITCHED NETWORKS: Three Phases, Efficiency, Delay, Circuit-Switched Technology. 4.5 DATAGRAM NETWORKS: Routing Table, Efficiency, Delay, Datagram Networks. 4.6 VIRTUAL-CIRCUIT NETWORKS: Addressing, Three Phases, Efficiency. Delay in Virtual-Circuit Networks, Circuit-Switched Technology. 4.7 STRUCTURE OF A SWITCH: Circuit Switches, Packet Switches. | 15 |
| 5 | Error Detection and Correction 5.1 INTRODUCTION: Types of Errors, Redundancy, Detection Versus Correction, Forward Error Correction Reverse Error Correction. 5.2 BLOCK CODING: Error Detection, Error Correction, Hamming Distance And Minimum Hamming Distance. 5.3 Liner Block Code, CRC, Checksum | 10 |
| 6 | Telephone and Cable Networks 6.1 TELEPHONE NETWORK: Major Components, topology, Signalling, Services Provided by Telephone Networks, echo & noise in transmission system. 6.2 DIAL-UP MODEMS: Modem Standards, type of modems 6.3 DIGITAL SUBSCRIBER LINE: DSL, ADSL Lite, HDSL, SDSL, VDSL. | 8 |
| 7 | Cellular and Satellite Networks 7.1 SATELLITE NETWORKS: Orbits, Footprint, Three Categories of Satellites, GEO Satellites, MEO Satellites, LEO Satellites. 7.2 CABLE TV NETWORKS and DATA TRANSFER: Traditional Cable Networks, Hybrid Fibre-Coaxial (HFC) Network, Bandwidth, Sharing. 7.3 CELLULAR TELEPHONY: Frequency-Reuse Principle, Transmitting, Receiving, Roaming, First Generation, Second Generation, Third Generation. 7.4 BLUETOOTH: Architecture, Bluetooth Layers | 8 |



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RECOMMENDED BOOKS

TEXT BOOK

1. Behrouz A Forouzan, Data Communication and Networking, 4e, Tata McGraw-Hill, 2008.
2. William Stallings, Data and Computer Communications, 8e, Pearson Education, 2008.

REFERANCES

1. Tomasi Wayne, Introduction to Data Communications and Networking, Pearson Education, 2007.
2. Rajneesh Agrawal and Bharat Bhushan Tiwari, Data Communication and Computer Networks, Vikas Publishing house Ltd., 2005.
3. S. Tanenbaum, Computer Networks, Fourth Edition, Pearson Education.
4. Leon-Gracia and I. Widjaja, Communication Networks, Tata McGraw Hill, 2004.
5. K. Pahlavan and P. Krishnamurthy, Principles of Wireless Networks, PHI Learning



RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL DIPLOMA IN COMPUTER SCIENCE & ENGINEERING

SEMESTER: **THIRD**
COURSE CODE: **304**
NAME OF COURSE: **Data Structure & Algorithms**

SCHEME: **Jul.09**
PAPER CODE: **6371**

COMMON WITH PROGRAM (S):

RATIONALE

Data Structure & Algorithms is one of the key courses in computer programming. The course serves as the foundation upon which many other computer science fields are built. The knowledge of data structures is a must for any person, who wishes to work in design implementation, testing or maintenance of virtually any software system. The course gives clear idea about mapping various processes or operation into the algorithms. The same can be tested on paper for faithfulness, correctness, termination and complexity before coding it into any programming language. The subject is independent of programming language and is supported by many modern compilers.



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SEMESTER: **THIRD**
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NAME OF COURSE: **Data Structure & Algorithms**

SCHEME: **Jul.09**
PAPER CODE: **6371**

COMMON WITH PROGRAM (S):

SCHEME OF STUDIES AND SPECIFICATION TABLE

Lecturers: **5 Hrs. Weeks**
Practical: **4 Hrs. per Week**

| Sr. No. | TOPICS | THEORY (HRS) |
|----------------|----------------------------------|-------------------------|
| 1. | INTRODUCTION | 5 |
| 2. | ARRAYS | 8 |
| 3. | SYMBOL TABLES | 5 |
| 4. | STACKS AND QUEUES | 10 |
| 5. | LINKED LISTS | 10 |
| 6. | SEARCHING AND SORTING ALGORITHMS | 9 |
| 7. | TREES | 10 |
| 8. | GRAPHS | 10 |
| 9. | STORAGE MANAGEMENT | 8 |
| | TOTAL | 75 |



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COMMON WITH PROGRAM (S):

COURSE CONTENT

Lecturers: **5 Hrs. Weeks**
Practical: **4 Hrs. per Week**

| Sr. No. | Course Content | Hours of Study |
|---------|---|----------------|
| 1. | INTRODUCTION 1.1: Introduction to algorithm design and data structure 1.2: Top-down and bottom-up approaches to algorithm design 1.3: Analysis of Algorithm, complexity measures in terms of time and space 1.4: Concept of Pointer Variable | 5 |
| 2. | ARRAYS 2.1: Representation of arrays : single and multidimensional arrays 2.2: Address calculation using column and row major ordering. | 8 |
| 3. | SYMBOL TABLES 3.1: Static symbol table. 3.2: Hash tables, Hashing Techniques. 3.3: Collision Handling Techniques | 5 |
| 4. | STACKS AND QUEUES 4.1: Representation of stacks and queues using arrays 4.2: Type of queues-Linear queue, circular queue, De-queue 4.3: Applications of stacks: Conversion form infix to postfix and prefix expressions, Evaluation of postfix expression using stacks. | 10 |



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COMMON WITH PROGRAM (S):

COURSE CONTENT

Lecturers: **5 Hrs. Weeks**
Practical: **4 Hrs. per Week**

| Sr. No. | Course Content | Hours of Study |
|---------|--|----------------|
| 5. | LINKED LISTS 5.1: Singly linked list : operations on list 5.2: Linked stacks and queues. 5.3: Polynomial representation and manipulation using linked lists 5.4: Circular linked lists. 5.5: Doubly linked lists. 5.6: Generalized lists. | 10 |
| 6. | SEARCHING AND SORTING ALGORITHMS 6.1: Searching Algorithm: Sequential search, binary searches, Indexed search. 6.2: Sorting Algorithm: Insertion sort, selection sort, bubble sort, Quick sort, merge sort, Heap sort, Radix sort, Sorting on multiple keys. | 9 |
| 7. | TREES 7.1: Basics of Trees: Binary tree traversal methods, Preorder traversal, In-order traversal, Post-order traversal, 7.2: Representation of trees and its applications: Binary tree. 7.3: Threaded binary trees. 7.4: Binary Search Tree, Heap 7.5: Height Balanced (AVL) Tree, B-Trees | 10 |
| 8. | GRAPHS 8.1: Basics of Graphs 8.2: Graph representation: Adjacency matrix, Adjacency lists. 8.3: Minimum Spanning Trees, Prim's and Kruskal's Algorithm 8.4: Traversal schemes: Depth first search, Breadth first search. 8.5: Shortest path Algorithms: Single source shortest path, all pair shortest path. | 10 |



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COMMON WITH PROGRAM (S):

| Sr. No. | Course Content | Hours of Study |
|---------|---|----------------|
| 9. | STORAGE MANAGEMENT 9.1: Automatic List Management. 9.2: Reference Count Method. 9.3: Garbage Collection. 9.4: Automatic List Management. 9.5: Concept of Dynamic Memory Management | 8 |



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COMMON WITH PROGRAM (S):

LIST OF EXPERIMENT

Lecturers: 5 Hrs. Weeks
Practical: 4 Hrs. per Week

| Sr. No. | Course Content | Hours of Study |
|----------------|--|-----------------------|
| 1. | Programme implementation for a) Reading and printing of single array and multidimensional array. b) Matrix manipulation. c) For one dimensional, 2D & 3D array. | 15 |
| 2. | Program implementation for creating, updating, deleting, traversing, searching and sorting of arrays, linear and circular link, lists, doubly link list, stacks and queues, trees, post, prefix. | 20 |
| 3. | Program implementation for manipulation of strings and match algorithms. Program implementation for agency matrix, traversing and searching. | 15 |
| 4. | Program implementation for adjacency creating matrix tree. | 10 |
| | Total | 60 |

Note: All Algorithms should be developed in C/C++



RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

DIPLOMA IN COMPUTER SCIENCE & ENGINEERING

SEMESTER: **THIRD**
COURSE CODE: **304**
NAME OF COURSE: **Data Structure & Algorithms**

SCHEME: **Jul.09**
PAPER CODE: **6371**

COMMON WITH PROGRAM (S):

REFERENCES

TEXT BOOKS:

- Sahani, Data structure & Algorithms, TMH.
- Langsam, Tenenbaum, Data Structure using C/C++, PHI Learning
- Data structure(schaum outline series) Indian edition, TMH

REFERENCE BOOKS:

- Drozdek Adams, Data Structures and Algorithms in C++, Vikas Publishing House Pvt. Ltd.
- Kunth D. E., Art of Computer Programming and Fundamentals of Algorithms, Vol.-I, Narosa.
- Kunth, Art of computer programming, Vol.-III, Sorting searching.
- Wirth Niklaus, Algorithm + Data = Program, PHI Learning
- Drozdek Adams, Data structures & Algorithms in Java, Vikas.
- Lipschutz, Data structure, Schaum out line series, TMH.
- Kruse, Leung & Tondo, Data structure & Program design in C, PHI Learning
- Kutti & Pandye, Data Structures in C++, PHI Learning
- Thomas A Staudish, Data Structure Techniques.
- Sanjeev Sofat, Data structure in C and C++, Khanna Book Publishing Co.
- Classic Data Structures by Debasis Samanta, PHI Learning.
- Shukla, Data structures using C & C ++ Wiley India
- Trimblay, introduction to Data structures With application's TMH



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SEMESTER: **THIRD**
COURSE CODE: **305**
NAME OF COURSE: **Programming with C++**
COMMON WITH PROGRAM (S):

SCHEME: **Jul.09**
PAPER CODE:

RATIONALE

C++ is a powerful modern language that combines the power, elegance and flexibility of C and the features of object-oriented programming. With its object-oriented capabilities such as data abstraction, inheritance and polymorphism, C++ offers significant software engineering benefits over C. Programming pundits expect that C++ will replace C as a general-purpose programming language. C++ is the language of future

The key concepts of **Programming with C++** are introduced in this course. The Experimental portion continues the development of C and C++ from the Types and Object modules. The course will enable the student to acquire:

- Knowledge and understanding of the principles of C++ and appreciation of its benefits compared with other approaches.
- Ability to design with a method to support the process of object orientation.



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NAME OF COURSE: **Programming with C++**
COMMON WITH PROGRAM (S):

SCHEME: **Jul.09**
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LIST OF EXPERIMENTS

Practical: 4 Hrs. per Week

| Name of Experiment | | Hours of Study |
|---------------------------|--|-----------------------|
| 1. | Problems involving sequence, selection and iteration. | 2 |
| 2. | Small problems mainly computational to illustrate expression and operator precedence. | 2 |
| 3. | Programmes such as: GCD, Sum of series, Fibonacci Series, Even and Odd series, Finding root of a function, Sequence of a numbers, Checking prime number, Largest among given number etc. | 6 |
| 4. | Problems relating to arrays: Print, Reverse, Sum, Maximum and Minimum, Insert and Delete elements etc. | 6 |
| 5. | Problems related to classes and objects. | 4 |
| 6. | Problems to illustrate constructor & destructor. | 4 |
| 7. | Problems related to inline functions. | 4 |
| 8. | Problems related to friend functions. | 4 |
| 9. | Problems related to operator overloading. | 4 |
| 10. | Problems related to default arguments, function overloading, functions overriding. | 8 |
| 11. | Problems related to different types of inheritance. | 8 |
| 12. | Moderately large function based problems for which the solutions should be represented by coordinating modules. Formatting a text, replacing a given word in a text with another, counting the number of words, in a text. | 8 |
| Total | | 60 |



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NAME OF COURSE: **Programming with C++**
COMMON WITH PROGRAM (S):

SCHEME: **Jul.09**
PAPER CODE:

REFERENCES

TEXT BOOKS

- Balguruswamy E. (2001), Object-Oriented Programming with Turbo C++, 3rd edition, TMH.
- Lafore Rober, (2001), Object-Oriented Programming in Turbo C++, 3rd edition, Galgotia Publications.
- M. kumar, programming with C ++,

REFERENCE BOOKS

- Shukla, object oriented programming in C++, wiley India.
- Stevens, Teach Yourself C++, BPB
- Schildt H, 1997, C++ Complete Reference, TMH
- Kanetkar Y, Programming in C++ ,BPB.
- Mahapatra P.B, Thinking in C++, Khanna Publisher.
- Bruce Euckel , Thinking in C++.
- Introduction to object oriented programming in C++,TMH ISRD group



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SEMESTER: **THIRD**
COURSE CODE: **306**
NAME OF COURSE: **Visual Basic Programming**

SCHEME: **Jul.09**
PAPER CODE:

COMMON WITH PROGRAM (S):

Practical: 4 Hrs. per week

RATIONALE

Visual Basic is a leading edge GUI based language because of even driven and object based programming language that will be immediately useful to students as they leave the institutional environment. It is introduced in this semester as students with little or no programming experience can develop smart systems satisfying professional needs. VB platform provides heavy duty, high-performance, capabilities needed for enterprise system development.



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SEMESTER: **THIRD**
COURSE CODE: **306**
NAME OF COURSE: **Visual Basic Programming**

SCHEME: **Jul.09**
PAPER CODE:

COMMON WITH PROGRAM (S):

Practical: 4 Hrs. per week

| Sr No | Particulars | Hrs of Study |
|--------------|--|---------------------|
| 1 | Introductory Part <ol style="list-style-type: none">1. Knowledge of IDE of VB, Menu Bar, Tool Bar, Project Explorer, Tool Box, Properties Window, Form Designer, Form Layout, Immediate Window.2. Concept of Event Driven Programming.3. Customizing the environment: Editor Tab, Format Tab, General Tab, Docking Tab, and Environment Tab.4. Working with Form: Loading, Showing & Hiding Form.5. Controlling one form from another. | 15 |
| 2 | Practical Part Experiments based on: <ol style="list-style-type: none">1. Data types of VB.2. Control Flow Statements and conditional Statements.3. Array and types of Arrays.4. Designing Menus and Pop-Up Menus.5. Use of MsgBox & InputBox.6. VB Controls.7. Control Arrays & Collections.8. Procedures, Subroutines & Functions.9. Graphics with VB.10. MDI | 20 |
| 3 | Application Development Using VB Like: <ol style="list-style-type: none">1. Exam System2. Library System3. Banking System4. Hospital System5. Inventory & Stock System6. Small Gaming Programme.7. Student Record System | 25 |
| | Total | 60 |



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SEMESTER: THIRD
COURSE CODE: 306
NAME OF COURSE: Visual Basic Programming

SCHEME: Jul.09
PAPER CODE:

COMMON WITH PROGRAM (S):

Practical: 4 Hrs. per week

REFERENCES

REFERENCE BOOKS:

1. Visual Basic 6 by Deitel & Deitel Nietro, Person Education.
2. Programming with Visual Basic 6.0 Mohammed Azam, Vikas Publication.
3. Visual Basic 6 from the ground up, gary cornell, TMH
4. Visual Basic 6 in easy steps T.M Andercon willey India



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