



RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL DIPLOMA IN INFORMATION TECHNOLOGY

SEMESTER: THIRD

COURSE CODE: 301

NAME OF COURSE: COMPUTER ARCHITECTURE

COMMON WITH PROGRAM (S): COMPUTER HARDWARE & MAINTENANCE

SCHEME: Jul.10

PAPER CODE: 6344

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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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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NAME OF COURSE: **COMPUTER ARCHITECTURE**

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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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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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	5
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.	6



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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



RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL DIPLOMA IN INFORMATION TECHNOLOGY

SEMESTER: THIRD

COURSE CODE: 302

NAME OF COURSE: OPERATING SYSTEM

COMMON WITH PROGRAM (S): COMPUTER HARDWARE & MAINTENANCE

SCHEME: Jul.10

PAPER CODE: 6345

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 Seven.

The course provides clear vision, understanding and working of Operating Systems.



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SEMESTER: **THIRD**
COURSE CODE: **302**

SCHEME: **Jul.10**
PAPER CODE: **6345**

NAME OF COURSE: **OPERATING SYSTEM**

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

SCHEME OF STUDIES AND SPECIFICATION TABLE

Lectures: **5Hrs.** per week
Practical: **2 Hrs.** per week

SCHEME OF STUDIES

Sr. No.	TOPICS	THEORY (HRS)	PRACTICAL (HRS)	TOTAL (HRS)
1.	Introduction to Operating System	10	04	14
2.	Process Management	16	06	22
3.	Memory Management	16	04	20
4.	File System	10	06	16
5.	Device Management	10	06	16
6.	Protection & Security	07	04	11
7.	Other Operation System	06	00	06
	TOTAL	75	30	105

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



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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. 1.4 Case study of UNIX, Linux, Windows Vista & Windows Seven.	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. 2.4 Case study of UNIX, Linux, Windows Vista & Windows Seven on Process Management.	16



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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. 3.4 Case study of UNIX, Linux, Windows Vista & Windows Seven on Memory Management.	16
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. 4.3 Case study of UNIX, Linux, Windows Vista & Windows Seven on File Management System.	10
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. 5.3 Case study of UNIX, Linux, Windows Vista & Windows Seven on Device Management.	10
6.	PROTECTION AND SECURITY 6.1 Goal of Protection, Domain of Protection, Security Problems Authentication, 6.2 Case study of UNIX, Linux, Windows Vista & Windows Seven on Protection & Security.	07
7.	Other Operation System 7.1 Introduction to Network Operation System (Only Brief Concept). 7.2 Introduction to Distributed Operation System (Only Brief Concept).	06



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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)	5
4	Simulation of Paging	5
5	Case study of UNIX, Linux, Windows Vista, Windows Seven & 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.

REFERENCE BOOKS

1. Beach M.J., Operating System, PHI
2. Milankovic, Operating Systems, TMH
3. Donovons & Mendric, Operating Systems, TMH.
4. .William stalling Operating System, pearson edu.
5. Operating System Principal and Design by Pabitra Pal Choudhury , PHI



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SEMESTER: THIRD
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SCHEME: Jul.10
PAPER CODE: 6346

NAME OF COURSE: NETWORKING ESSENTIALS
COMMON WITH PROGRAM (S): COMPUTER HARDWARE & MAINTENANCE

RATIONALE

Information and communication are two of the most important strategic issues for the success of every enterprise. While today nearly every organization uses a substantial number of computers and communication tools (telephones, fax, personal handheld devices), they are often still isolated. While managers today are able to use the newest applications, many departments still do not communicate and much needed information cannot be readily accessed.

To overcome these obstacles in an effective usage of information technology, computer networks are necessary

This subject introduces the students to the world of networking. Before one learns the technology of networking it is essential that the student has thorough understanding of various terminologies and concepts. The student gets introduced to network topologies, architectures, protocols, devices, etc.



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PAPER CODE: 6346

NAME OF COURSE: NETWORKING ESSENTIALS

COMMON WITH PROGRAM (S): COMPUTER HARDWARE & MAINTENANCE

SCHEME OF STUDIES AND SPECIFICATION TABLE

Lectures: 4Hrs. per week
Practical: 2 Hrs. per week

SCHEME OF STUDIES

S.No.	TOPICS	THEORY (HRS.)	PRACTICAL (HRS)	TOTAL (HRS)
3.	Introduction	06	04	10
4.	Networking Models	14	06	20
5.	Network Address	12	06	18
6.	Network Operating System(NOS)	10	07	17
7.	Networking Components	18	06	21
	TOTAL	60	30	90



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NAME OF COURSE: NETWORKING ESSENTIALS

COMMON WITH PROGRAM (S): COMPUTER HARDWARE & MAINTENANCE

COURSE CONTENT

Lectures: 4 Hrs. per week

S.NO.	COURSE CONTENT	HOURS OF STUDY
1	INTRODUCTION : 1.1 Basics of Networks - Definition, Need, Uses and Advantages. 1.2 Types of Computer Networks-Local area Networks (LAN), Wide Area Networks(WAN) , Metropolitan Area Network(MAN). 1.3 Network Architectures- Peer to Peer , Client-Server, Hybrid, Intranet and Internet. 1.4 Different Topologies – Bus, Ring, Star, Hybrid .	06
2	NETWORKING MODELS : 2.1 OSI Reference Model- Introduction to each layer , Its Functionalities , Related Protocols and device name. 2.2 TCP/IP Reference Model- Introduction to each layer , Its Functionalities , Related Protocols and device name. 2.3 comparison Between OSI Vs. TCP/IP reference Model. 2.4 Introduction to various LAN Protocols. 2.5 Introduction to various WAN Protocols.	14



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3	Network Address : 3.1 Overview, Type of Addresses : Physical Address and Logical address 3.2 Physical Address: Need , Advantages And Disadvantages 3.3 Logical Address : Need , Advantages And Disadvantages 3.4 IP Addresses : Class Full Addressing Network ID, Host ID Special Addressing 3.5 Overview Subnetting and Supernetting	10
4	Network Operating System(NOS): 4.1 Features of NOS : Multiuser , multitasking , time sharing, Distributed Operating System 4.2 Types of Client / Server Operating System. Open Sources And Windows Operating System	10
5	Networking Components: 5.1 Networking Media – Coaxial, UTP, Shielded Twisted Pair, Fiber Optical Cable, wireless media. 5.2 Networking Devices – NIC, Modem , Hub, Repeater, Switches, Bridge, Router, Wi-Fi , VSAT. 5.3 Structured cabling- Concept, advantages, racks, patch panel, crimping, crimping and punch tool, patch cords, RJ Connectors, Information Outlets (I/O Box) , Media Converter 5.4 Types of Connectivity – Dial up, Digital Subscriber 5.5 Link (DSL), Asynchronous Digital Subscriber Link (ADSL) , Leased line /Non Exchange , Cable Net , WI-FI, WI-MAX, CDMA,GSM.	18
	TOTAL	60



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LIST OF EXPERIMENTS

Practical: 2 Hrs. per Week

S.NO.	NAME OF EXPERIMENTS	Hours of Study
1	Observation and Study of Various Network Devices	
2	Observation and Study of Various Type of Network Topologies	
3	Crimping of UTP Cable(cross over, straight) and Testing of cables.	
4	Observation and Study of ad-hoc networks and Structured networks	
5	Installation of Various types of Network Devices	
6	Implementation of small Network segment	
7	Identifying valid IP Addresses, Defining Subnet IDs and Host IDs.	
8	Design a Small enterprise Network and configure all Network Devices and assign IP Addresses	
	TOTAL	30



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BOOKS RECOMMENDED

1. **Local Area Networks** by Forouzon – Tata Mcgraw Hills Ltd. India.
2. **Introduction to Networking** by Richard McMohan Publisher Tata Mcgraw Hills Ltd. India.
3. **Network Cabling Handbook** by Chris Clerk Publisher Tata Mcgraw Hills Ltd. India.
4. **ABC'S of Local Area Network** By Michael Dorth, BPB Publications, New Delhi



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SEMESTER: THIRD

SCHEME: Jul.10

COURSE CODE: 304

PAPER CODE: 6371

NAME OF COURSE: DATA STRUCTURES AND ALGORITHMS

COMMON WITH PROGRAM (S): COMPUTER SCIENCE & ENGINEERING

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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SCHEME: Jul.10
PAPER CODE: 6371

NAME OF COURSE: DATA STRUCTURES AND ALGORITHMS

COMMON WITH PROGRAM (S): COMPUTER SCIENCE & ENGINEERING

SCHEME OF STUDIES AND SPECIFICATION TABLE

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

Sr. No.	TOPICS	THEORY (HRS)
7.	INTRODUCTION	5
8.	ARRAYS	8
9.	SYMBOL TABLES	5
10.	STACKS AND QUEUES	10
11.	LINKED LISTS	10
12.	SEARCHING AND SORTING ALGORITHMS	9
13.	TREES	10
14.	GRAPHS	10
15.	STORAGE MANAGEMENT	8
	TOTAL	75



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NAME OF COURSE: **DATA STRUCTURES AND ALGORITHMS**

COMMON WITH PROGRAM (S): **COMPUTER SCIENCE & ENGINEERING**

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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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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COURSE CONTENT

Lecturers: 5 Hrs. Weeks

Practical: 4 Hrs. per Week

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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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++



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NAME OF COURSE: **DATA STRUCTURES AND ALGORITHMS**
COMMON WITH PROGRAM (S): **COMPUTER SCIENCE & ENGINEERING**

REFERENCES

TEXT BOOKS:

- Sahani, Data structure & Algorithms, TMH.
- Langsam, Tenenbaum, Data Structure using C/C++, PHI Learning

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.



RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL DIPLOMA IN INFORMATION TECHNOLOGY

SEMESTER: THIRD

COURSE CODE: 305

NAME OF COURSE: OBJECT ORIENTED PROGRAMMING WITH C++

COMMON WITH PROGRAM (S):

SCHEME: Jul.10

PAPER CODE: 6430

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. The key concepts of Object Oriented Programming and C++ are introduced in this course. The experimental portion helps to enhance the skill of software development in students using object oriented concepts like objects, classes, overloading, inheritance, polymorphism etc. The course will enable the student to acquire:

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



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NAME OF COURSE: **OBJECT ORIENTED PROGRAMMING WITH C++**

COMMON WITH PROGRAM (S):

COURSE CONTENT

Course duration: **15 weeks**

Lectures: **5 Hrs. per week**

S. NO	Course Content	Hours of Study
1	Overview of C++ : Object oriented programming, Concepts, Advantages, Usage. C++ Environment: Program development environment, C versus C++, the C++ language standards. Introduction to various C++ compilers, C++ standard libraries, C++ basics , loops and decisions, structures and functions	8
2	Classes & Objects : Classes versus Structure & Union, Scope resolution operator, Inline function, Passing objects to function, Returning objects, Object assignment, Friend function, Friend classes, , Static class members, Static data member, Static member function,	10
3	Constructor & Destructor: Introduction, simple Constructor, Parameterized constructor, Multiple constructor in a class, Constructor with default argument, Destructor ,Default Argument ,array, Pointers References & C++ 's Dynamic Allocation operators, Array of objects, Pointers to object, This pointer, Pointer to class members, References: Reference parameter, Passing references to objects, Returning reference, Independent reference, Dynamic Constructor, Copy constructor.	12
4	Function & operator overloading : Function overloading, Overloading constructor function finding the address of an overloaded function, Operator Overloading: Creating a member operator function, Creating Prefix & Postfix forms of the increment & decrement operation, Overloading the shorthand operation (i.e. +=,-= etc), Operator overloading restrictions, Operator overloading using friend function, Overloading New & Delete, Overloading some special operators, Overloading [], (), -, comma operator, Overloading.	13
5	Inheritance : Types of Inheritances, Access control specifiers : public, private, protected members, Protected, private and public base class inheritance, Inheriting multiple base classes, Constructors and destructors in Inheritance, Passing parameters to base class constructors, Granting access, Virtual base classes . Virtual functions & Polymorphism : Virtual function, Pure Virtual functions, abstract classes, Early Vs. late binding	12
6	The C++ I/O system basics : C++ streams, The basic stream classes: C++ predefined streams, Formatted I/O: Formatting using the ios members, Setting the format flags, Clearing format flags, An overloaded form of setf (), Examining the formatted flags, Setting all flags, Using width() precision() and fill(), Using manipulators to format I/O, Creating your own manipulators., creating insertors and extractors.	10
7	Exception handling : try, catch and throw, File I/O basics, fstream classes, creating disk files and file manipulations using seekg(), seekp(), tellg(), and tellp() functions. UML Concepts, UML Diagrams, UML specifications, object model, object diagrams.	10
	TOTAL	75



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LIST OF EXPERIMENTS

Course duration: **15** weeks

Practical:**2** Hrs. per week

S. NO	Name of experiments	Hours of Study
1	Programs involving sequence, selection and iteration.	3
2	Programs involving arrays and functions.	2
3	Programs related to classes and objects.	3
4	Programs to illustrate constructor & destructor, inline functions.	3
5	Programs related to friend functions.	2
6	Programs related to function overloading, default arguments.	3
7	Programs related to operator overloading.	3
8	Programs related to different types of inheritance.	3
9	Programs related to functions overriding, polymorphism.	2
10	Programs related to exception handling	2
11	Programs related to I/O formatting using manipulatur & ios class functions	2
12	Programs related to file handling	2



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PAPER CODE:

TEXT & REFERENCE BOOKS :

- ⊕ *Herbert Schildt, "C++ The Complete Reference" - TMH Publication ISBN 0-07-463880-7*
- ⊕ *R. Subburaj, "Object Oriented Programming With C++", Vikas Publishing House, New Delhi. isbn 81-259-1450-1*
- ⊕ *E. Balguruswamy, "C++", TMH Publication ISBN 0-07-462038-x*
- ⊕ *M Kumar "Programming In C++", TMH Publications*
- ⊕ *R. Lafore, "Object Oriented Programming C++"*
- ⊕ *Ashok . N. Kamthane, "Object Oriented Programming with ANSI & Turbo C++", Pearson Education Publication, ISBN 81-7808-772-3*