Department of Computer Science (IIEIS), Government College. Ropar

(2023-24)

Class PGDCA Sem. 1st Subject Programming in C- Language

Time Period	Topics to be Covered
Week 1	Programming Process: Problem definition, Algorithm development, Flowchart, Coding, Compilation and debugging.
Week 2	Basic structure of C program: History of C, Structure of a C program, Character set, Identifiers and keywords, constants, variables, data types.
Week 3	Control statements: branching statements (if, if else, switch), loop statements (for, while and do-while), jump statements (break, continue, goto), nested control structures.
Week 4	Functions: Library functions and user defined functions, prototype, definition and call, formal and actual arguments, local and global variables, methods of parameter passing to functions, recursion. I/O functions: formatted & unformatted console I/O functions
Week 5	Storage Classes: automatic, external, static and register variables.
Week 6	Arrays: – One dimensional and two dimensional arrays
Week 7	Declaration, initialization, reading values into an array, displaying array contents Strings: input/output of strings, string handling functions (strlen, strcpy, strcmp, strcat & strrev), table of strings.
Week 8	MST (Mid-Semester Test)
Week 9	MST (Mid-Semester Test)
Week 10	Structures and unions: using structures and unions, comparison of structure with arrays and union.
Week 11	Pointers: pointer data type, pointer declaration, initialization, accessing values using pointers,
Week 12	pointers and arrays.
Week 13	revision
Week 14	Introduction to Files in C: opening and closing files.
Week 15	Basic I/O operation on files.
Week 16	Queries from students

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LESSON PLAN (Session 2021-22)

PGDCA

Subject: Operating System (Sem 1)

SESSION	TOPIC
August (Month 1)	**Week 1 Introduction:** Operating System: uses of computer networks, Goals and applications of networks, computer network structure and architecture.
	Week 2 Function of Operating System, Features of Operating System
	Week 3 Medium Access Sublayer : Static and dynamic channel allocation for LAN and MAN ALOHA Protocols
	Week 4 CPU Scheduling
September (Month 2)	Mid semester Test-I
	Week 5 Networking and Internetworking devices: Repeater, bridges, routers, gateways, switches.
	Week 6 Computer networks hardware and software
	Week 7 High speed LAN: FDDI, Fast Ethernet, HIPPI, Fiber channel.
October (Month 3)	**Week 8 LAN IEEE 802.x standards.** Routing: Static vs. Dynamic Routing, various Routing Algorithms.
	Week 9 Congestion Control: Causes of Congestion, Various Congestion Control Strategies and Algorithms Mobile telephone, mobile telephone switching office. Congestion Control: Causes of Congestion, Various Congestion Control Strategies and Algorithms Mobile telephone, mobile telephone switching office.
	Week 10 **Mid semester Test-II**
	Week 11 Internet protocols: Principles of Internetworking, connectionless internetworking

November	Week 12 Internet protocols, IPv6.
	Week 13 Network Security: Security requirements and attacks
	Week 14 Encryption Public key encryption and digital Signatures. distributed applications: SNMP, SMTP, HTTP.
(Month 4)	Week 15 Revision

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Department of Computer Science (HEIS), Government College. Ropar

(2021-22)

Class PGDCA Sem. 1st Subject Programming in C- Language

Time Period	Topics to be Covered
Week 1	Programming Process: Problem definition, Algorithm development, Flowchart, Coding, Compilation and debugging.
Week 2	Basic structure of C program: History of C, Structure of a C program, Character set, Identifiers and keywords, constants, variables, data types.
Week 3	Control statements: branching statements (if, if else, switch), loop statements (for, while and do-while), jump statements (break, continue, goto), nested control structures.
Week 4	Functions: Library functions and user defined functions, prototype, definition and call, formal and actual arguments, local and global variables, methods of parameter passing to functions, recursion. I/O functions: formatted & unformatted console I/O functions
Week 5	Storage Classes: automatic, external, static and register variables.
Week 6	Arrays: – One dimensional and two dimensional arrays
Week 7	Declaration, initialization, reading values into an array, displaying array contents Strings: input/output of strings, string handling functions (strlen, strcpy, strcmp, strcat & strrev), table of strings.
Week 8	MST (Mid-Semester Test)
Week 9	MST (Mid-Semester Test)
Week 10	Structures and unions: using structures and unions, comparison of structure with arrays and union.
Week 11	Pointers: pointer data type, pointer declaration, initialization, accessing values using pointers,
Week 12	pointers and arrays.
Week 13	revision
Week 14	Introduction to Files in C: opening and closing files.
Week 15	Basic I/O operation on files.
Week 16	Queries from students

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(2021-22)

Class PGDCA Sem. 2nd Subject :- Object Oriented programming

Time Period	Topics to be Covered
Week 1	Evolution of OOP: Procedure Oriented Programming, OOP Paradigm, Advantages and disadvantages of OOP over its predecessor paradigms. Characteristics of Object Oriented Programming.
Week 2	Introduction to C++: Identifier, Keywords, Constants. Operators: Arithmetic, relational, logical, conditional and assignment. Size of operator, Operator precedence and associativity
Week 3	Type conversion, Variable declaration, expressions, statements, manipulators. Input and output statements, stream I/O, Conditional and Iterative statements,
Week 4	breaking control statements. Storage Classes, Arrays, Arrays as Character Strings, Structures, Unions, Bit fields,
Week 5	Enumerations and User defined types. Pointers: Pointer Operations, Pointer Arithmetic, Pointers and Arrays, Multiple indirections, Pointer to functions..
Week 6	Functions: Prototyping, Definition and Call, Scope Rules. Parameter Passing by value, by address and by reference, Functions returning references, Const functions, recursion, function overloading, Default Arguments, Const arguments, Pre-processor, Type casting.
Week 7	Classes and Objects: Class Declaration and Class Definition, Defining member functions, making functions inline, Nesting of member functions, Members access control. THIS pointer. Objects: Object as function arguments,
Week 8	MST (Mid-Semester Test)
Week 9	MST (Mid-Semester Test)
Week 10	Conditional Statements : if Statement , case Statement; Iteration Statements : for Statement, while Statement, until Statement, shift Command, select Statement, repeat Statement, Functions. Editing and Typesetting : Text Editors vi, The vi Editor, Starting vi, vi modes,
Week 11	array of objects, functions returning objects, Const member. Static data members and Static member functions, Friend functions and Friend classes

Week 12	Constructors: properties, types of constructors, Dynamic constructors, multiple constructors in classes. Destructors: Properties, Virtual destructors. Destroying objects, Rules for constructors and destructors. Array of objects. Dynamic memory allocation using new and delete operators, Nested and container classes, Scopes: Local, Global, Namespace and Class.
Week 13	revision
Week 14	Inheritance: Defining derived classes, inheriting private members, single inheritance, types of derivation, function redefining, constructors in derived class, Types of inheritance, Types of base classes, Code Reusability. Polymorphism: Methods of achieving polymorphic behavior. Operator overloading: overloading binary operator, overloading unary operators, rules for operator overloading
Week 15	operator overloading using friend function. Function overloading: early binding, Polymorphism with pointers, virtual functions, late binding, pure virtual functions and abstract base class. Difference between function overloading, redefining, and overriding. Templates: Generic Functions and Generic Classes, Overloading of template functions. Exception Handling catching class types, handling derived class exceptions, catching exceptions, restricting exception
Week 16	Queries from students

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Department of Computer Science (HEIS), Government College. Ropar
(2021-22)
Class PGDCA Sem. 1ST Subject Fundamental of Information Technology

SESSION	TOPIC
Week 1	Introduction: Historical Evolution of Computer, Block Diagram of computer, characterisation of computers, types of computers, the computer generations.
Week 2	Basic Anatomy of Computers: memory unit, input-output unit, arithmetic logic unit, control unit, central processing unit, RAM, ROM, PROM, EPROM.
Week 3	. Input-Output Devices: Keyboard, Mouse, Joy tick, Track Ball, Touch Screen, Light Pen, Digitizer, Scanners, Voice Recognition Devices, Optical Recognition devices,
Week 4	Computer hardware and software
Week 5	Binary Arithmetic: Addition, subtraction and multiplication
Week 6	Dot matrix, Character and Line printer, DeskJet printer, Laser printer, and plotters.
Week 7	Number System: Non-positional and positional number systems, Base conversion, binary, decimal, hexadecimal, and
Week 8	MST
Week 9	MST
Week 10	Computer Codes: weighted and non-weighted code, BCD, EBCDIC, ASCII, Unicode, XS-3, Grey Codes
Week 11	Octal systems, conversion from one system to the other.
Week 12	Computer Software: Introduction, types of software, systems software, GUI, operating system, high level languages, assemblers, compilers and interpreters, system utilities, application packages
Week 13	Basic concepts of algorithm and flow charts: Flow charts, algorithm and decision tables, stages in the development of computer program, testing and debugging, program documentation. Internet Related Concepts: Internet, Uses of Internet, Basic services of Internet, Email, FTP, TELNET, and WWW.
Week 14	Familiarities with terms: HTTP, HTTPS, URL, Web Browsers, IP Address, Domain Name, ISP, Web Portal, Search Engines, Blog, Surfing, Wiki.
Week 15	Applications of Information Technology and Trends: IT in Business and Industry, IT in Education & training, IT in Science and Technology, IT and Entertainment, Current Trends in IT Application - AI, Virtual Reality, Voice Recognition, Robots, Multimedia Technology.
Week 16	E-Commerce: Meaning, its advantages & limitations, Infrastructure for E-commerce, Types of E-Commerce Applications.

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Department of Computer Science (HEIS), Government College. Ropar
(2021-22)
Class MSc IT Sem. 3rd (LE) Subject Computer Network

Week	Topics to be covered
Week 1	Introduction to Computer Networks - Uses and significance of computer networks - Goals and applications of computer networks - Overview of computer network structure and architecture
Week 2	- Introduction to OSI model - Explanation of TCP/IP model - Comparative analysis of TCP/IP and OSI models - Introduction to Novell Netware and ARPANET
Week 3	- Static and dynamic channel allocation for LAN and MAN - Explanation of ALOHA protocols: Static ALOHA and Dynamic ALOHA
Week 4	- CSMA (Carrier Sense Multiple Access) - CSMA/CD (Carrier Sense Multiple Access with Collision Detection) - Collision-free protocols in LAN - Introduction to BRAP, MLMA, Binary Countdown, Limited Contention Protocol, Urn Protocol, Adaptive Tree Walk Protocol
Week 5	- Role and function of repeaters - Bridges: Types and usage - Routers: Principles and routing algorithms - Gateways and their significance - Introduction to network switches
Week 6	- Components of computer network hardware - Overview of network software: Protocols and services
Week 7	- Introduction to FDDI (Fiber Distributed Data Interface) - Fast Ethernet: Characteristics and benefits - Overview of HIPPI (High-Performance Parallel Interface) - Introduction to Fiber Channel technology
Week 8	-MST
Week 9	MST
Week 10	- Comparison between static and dynamic routing - Exploration of various routing algorithms, Explanation of Multiple Spanning Tree protocol
Week 11	- Causes of network congestion - Different strategies and algorithms for congestion control, - In-depth look at LAN IEEE 802.x standards
Week 12	- Introduction to mobile telephone technology - Functionality of Mobile Telephone Switching Office (MTSO)
Week 13	- Principles of internetworking - Introduction to connectionless internetworking

Week 14	- In-depth study of IPv6 protocol - Understanding IPv6 addressing
Week 15	- Security requirements for computer networks - Common network security attacks and countermeasures
Week 16	- Overview of encryption techniques - Public key encryption and digital signatures - Introduction to distributed applications: SNMP, SMTP, HTTP - Recap of the course and discussion of future trends in networking

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Department of Computer Science (HEIS), Government College, Ropar (2021-22)

Class PGDCA Sem. 2nd Subject: **Introduction to Computer Network, Internet and E-Commerce**

Week	TOPIC
Week 1	Networking: Basic, elements in networking, network topology, different types of network LAN, MAN, WAN, GAN, PAN. Networks connecting devices.
Week 2	Open system interconnection model (OSI) Different layers, TCP/IP model and layers. Introduction to intranet and extranet.
Week 3	Internet Concepts: History of the internet, advantages and disadvantages of internet, WWW,
Week 4	IP addressing, domain name system, introduction and working of e-mail.
Week 5	Data Communication: Introduction, Relays, Repeaters, Bridges, Routers, Gateways
Week 6	Introduction to Web browser and search engine: Definition features and type internet explorer, Mozilla Firefox and Netscape navigator.
Week 7	Search Engine (types, features etc.) Electronic meeting system (Audio conferencing, video conferencing, groupware
Week 8	**Mid semester Test**
Week 9	**Mid semester Test**
Week 10	Types of E-Commerce, infrastructure requirements for e-commerce, different ecommerce website and their features.
Week 11	Overview of E-Commerce Technologies: Ecommerce: Definition, difference with traditional commerce applications, advantages and disadvantages of e-commerce.
Week 12	Business models of E–Commerce: Business to Business, Business to customers, Customers to Customers, Business to Government, Business to Employee
Week 13	Electronic Payment System: Introduction, Online payment systems – prepaid and postpaid payment systems, e-cash, e-cheque,
Week 14	Electronic purse, Security issues on electronic payment system, Solutions to security issues Biometrics –Types of biometrics
Week 15	Gateways: Idea of SMS, Email and Payment Gateway Integration
Week 16	Smart Card, Credit Card, Debit Card

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