Govt. Polytechnic Hamirpur (H.P.)

Lesson Plan: Computer Programming using C

Branch: **Computer Engg.** Semester: **3rd**

Subject: **CPUC** Teacher: **AMIT NAYYER**

Class Mode: **Offline**

Lecture Number	Topics to be covered	Reference/ Resource	Remarks
	Unit 1 : Introduction to Programming		
1	Program Design Tools - Algorithm	R3	Lecture delivery will be through classroom teaching and Notes will be shared during lecture
2	Flowchart, Pseudocode	R3, R2	
3	Evolution of Programming Languages	R3, R2	
4	Programming Terminology - Program	R2,	
5	Compiler, Interpreter, Linker	R1	
6	Source Code, Libraries	R1	
7	Syntax and Semantic Errors	R2	
8	Bugs and discussion on the topics covered		
	Unit 2 : Introduction to C language		
9	Brief History of C Language	R2	Lecture delivery will be through classroom teaching and Notes will be shared during lecture
10	Features of C Language, Character Set	R3	
11	Identifier, Keywords, Literals	R3	
12	Variables, Constants	R3	
13	Structure of a 'C' Program	R3	
14	Comments, Preprocessor Directives	R1	
15	Data Types	R2	
16	Type Casting	R3	
17	Storage Classes	R1	
18	Discussion on the topics covered		
	Unit 3 : Input/Output		
19	Standard Input, Standard Output	R2	
20	Format Specifier	R2	
21	Unformatted I/O Functions, getchar(), putchar(),	R1	
22	gets(), puts()	R1	

23	Formatted I/O Functions, printf(), scanf(),	R2	
24	Standard Error,	R2	
25	I/O Redirection	R3	
26	Discussion on the topics covered	R3	
	Unit 4 : Operators		
27	Arithmetic Operators	R2	Lecture delivery will be through classroom teaching and Notes will be shared during lecture
28	Relational Operators	R1	
29	Logical Operators	R1	
30	Bitwise Operators	R2	
31	Assignment Operators,	R2	
32	Special Operators, Expressions	R3	
33	Associativity	R3	
34	Order of Precedence of Operators	R2	
35	Conditional Operator	R2	
36	Discussion on the topics covered	R1	
	Unit 5 : Flow Control Statements		
37	Selection Statements	R2	Lecture delivery will be through classroom teaching and Notes will be shared during lecture
38	if, if...else, Nested if	R2	
39	if...else if Ladder	R3	
40	switch...case	R3	
41	Loops - while, do...while,	R2	
42	for	R2	
43	Jump Statements - goto	R3	
44	break	R2	
45	continue, return;	R2	
46	Nested Loops,	R1	
47	Infinite Loops	R1	
48	Discussion on the topics covered	R2	
	Unit 6 : Arrays, Structures, Unions and Pointers		
49	Array, Memory Representation, One-Dimensional Arrays	R3	
50	and Two-Dimensional Arrays:	R3	
51	Declaration and Initialization	R2	
52	Enumeration, Strings,	R2	
53	String Constants, Escape Sequences,	R1	
54	Standard String Functions - srtlen(), strrev()	R1	

55	strcmp(), srtcpy(), strcat()	R2
56	Structures, Unions	R2
57	Pointer - Declaration, Initialization, Assignment	R3
58	Dynamic Memory Allocation: malloc(), calloc(), free()	R3
	Unit 7 : Functions	
59	Definition of Function	R2
60	Function Prototype	R1
61	, Formal and Actual Parameters	R1
62	, Function Call, Call by Value and Call by Reference,	R2
63	Arrays as Function Arguments,	R2
64	Recursion	R3

Teaching Resources:

R1: Problem Solving and Programming in C, R.S. Salaria, Khanna Publications

R2. Programming in ANSI C, E. Balagurusamy, Tata McGraw-Hill

R3. The C Programming Language, Brian Kernighan and Dennis Ritchie, Pearson

Teacher Signature

Date:

c/s HOD Signature

GOVT. POLYTECHNIC, HAMIRPUR (H.P.)
Practical Planning

Branch: Computer Engineering **Semester: 3rd**

Subject: Computer Programming using C **Session**:Aug 2025

Teacher: Amit Nayyer **Laboratory**: Yes

Sr. No.	No of Practical hours planned	Aim of the Practical	Reference for Procedure/ Writeup	Remarks
1	4	To set up and get familiar with the programming environment (Editor, Compiler, Linker)	R2	
2	2	To declare, initialize and use variables of various data types in 'C'.	R1, R3	
3	2	To demonstrate printf() and scanf() functions with different format specifiers.	R1, R3	
4	2	To demonstrate various arithmetic operators and arithmetic expressions.	R1, R3	
5	2	To demonstrate various bitwise operators.	R1, R3	
6	4	To use if…else statement to check whether a given year is a leap year.	R1, R3	
7	4	To use switch…case statement to print the numbers entered by the user (1-10) in words.	R1, R3	
8	4	To use while statement to reverse the digits of a given number.	R1, R3	
9	6	To use for statement to print the multiplication table of a given number.	R2	
10	6	To implement a menu driven arithmetic calculator using do while loop.	R1, R3	
11	4	To read the marks of 10 students in an array and calculate their average.		
12	4	To read two matrices and compute their sum using 2-Dimensional arrays.	R1, R3	
13	2	To reverse the characters of a given string.	R2	
14	4	To demonstrate strlen(), strcat(), strcmp() functions.	R1, R3	
15	2	To swap values of two variables using a function.		
16	4	To compute the factorial of a given number using recursion.		
17	4	To read the data of a student in a structure and print it.		
18	4	To count the number of vowels in a given string using a pointer.		

Signature of Teacher with Date **Signature of HOD**

GOVT. POLYTECHNIC, HAMIRPUR (H.P.)
Lesson Planning and Coverage

Branch: Computer Engineering **Semester: 5**th

Subject: Operating System **Session**: Aug -Dec 2025

Teacher: Vijay Kumar Sharma **Laboratory**: Yes

Sr. No.	No of Lectures	Chapter/ Unit Description	Detailed contents	Reference Resources	Remarks
1	12	UNIT 1: Overview of Operating Systems	Objectives and Functions of Operating Systems, Operating Systems Evolution - Batch Processing Systems, Multiprogramming Systems, Multiprocessing Systems, Time Sharing Systems, Personal Computer Operating Systems, Handheld Computer Systems, Real Time Systems, Distributed Systems; Operating System Architecture - Monolithic vs Microkernel	R1,R2,R4	
2	12	UNIT 2: Processes and Threads	Process, Process States, Process Life Cycle, Process Control Block (PCB), Threads, Multithreading, Inter-process Communication, Process Synchronization, Race Condition, Critical Section Problem and its Solutions, Deadlocks - Characterization, Necessary Conditions, Deadlock Avoidance, Prevention and Recovery	R1,R2,R4	
3	12	UNIT 3: CPU Scheduling	CPU Scheduler, Preemptive and Non-preemptive Scheduling, Scheduling Criteria - CPU Utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling Algorithms - First Come First Serve, Shortest Job First, Shortest Remaining Time First, Priority Scheduling, Round-Robin; Multiprocessor Scheduling	R1,R2,R4	
4	12	UNIT 4: Memory Management	Memory Hierarchy, Address Space, Address Translation, Memory Protection, Swapping, Contiguous Memory Allocation, Fixed Partition and Variable Partition Schemes, Memory Allocation Strategies, Fragmentation, Compaction, Non-Contiguous Memory Allocation, Paging, Segmentation, Virtual Memory, Demand Paging, Thrashing, Page Replacement Policies	R1,R2,R4	
5	6	UNIT 5: Storage Management	Storage Devices - Magnetic Tapes, Magnetic Disks, Optical Disks, Flash Storage; Sequential and Direct Access, Disk Scheduling - SCAN, CSCAN	R1,R2,R4	
6	6	UNIT 6: Linux Operating System	Features of Linux OS, GNU Project, Linux Architecture - Kernel, System Calls Interface, System Libraries, Shell	R1,R2,R3,R4	

References:

R1.Modern Operating Systems by Andrew S. Tanenbaum
R2. Operating System Internal and Design Principles by William Stallings
R3. Linux with Operating System Concepts By Richard Fox, Chapman and Hall
R4. Online resources.

COURSE OUTCOMES:

After completing this course students will be able to:

CO-1. Understand the terminology related to the domain of operating systems.
CO-2. Explain the role and functions of an operating system.
CO-3. Understand the architecture of modern operating systems.
CO-4. Understand basic techniques used by an OS to manage computing resources.

Signature of Teacher with Date **Signature of HOD**

GOVT. POLYTECHNIC, HAMIRPUR (H.P.)
Lesson Planning and Coverage

Branch: Computer Engineering
Semester: 3rd

Subject: Computer System Architecture **Session**: Aug-Dec 2025

Teacher: Mukesh Bhardwaj
Laboratory: Yes

Sr. No.	No of Lectures	Chapter/ Unit Description	Detailed contents	Reference Resources	Remarks
1	04	Introduction	Functional units of Digital Computer,Computer Organization.Computer Design, Computer Architecture, Von-Neumann and Harvard architecture,Bus Interconnection, Evolution of Microprocessors, Concept of Microcomputer,Microcontroller and Embedded Systems.	R1, R2	
2	10	Overview of Digital Electronics	Number systems: Decimal, Binary, Octal and Hexadecimal. Conversion from one number system to other number System, Signed Binary Numbers: Sign Magnitude Representation, One's Compliment Representation and Two's Compliment Representation. Binary Arithmetic: Addition, Subtraction, Binary Arithmetic using one's and Two's Compliment. Fixed and Floating Point Numbers, Computer Codes: BCD, EBCDIC, ASCII. Multiplication Algorithms - Hardware Implementation for Signed-Magnitude Data, Booth Multiplication Algorithm.	R1, R2	
3	10	Digital Logic	Logic Gates: Symbols and Truth Table, Boolean Algebra, Logic Diagram, De Morgan's Theorem, Combinational Circuits: Block Diagram, Half Adder, Full Adder, Flip Flop: SR, D Flip Flop and J K Flip Flop, Example of a sequential circuit, Decoder & Encoder: 3 to 8, Multiplexer & De Multiplexer: 4 to 1 line.	R1, R2	
4	8	Basic Architecture of Microproces	Basic features of 8085 Microprocessor, Block Diagram of	R1, R2	

		sor 8085	8085 Microprocessor, Functions of Various blocks, Concept of Buses, Bus Multiplexing and De-multiplexing, Status Flags, Addressing Modes and Interrupts.		
5	8	Central Processing Unit	Major Components of CPU, General Register Organization, Control Word, Stack Organization-Register and Memory Stack. Reverse Polish Notation and Evaluation of Arithmetic Expressions; Instruction formats – Three Address Instructions, Two Address Instructions, One Address Instructions, Zero Address Instructions. Brief Introduction to RISC and CISC Processors, Concept of Parallel Processing and Pipelining.	R1, R2	
6	8	Memory Organisatio n	Components of memory hierarchy: main memory, auxiliary memory and cache memory, Introduction to Associative Memory, Cache Memory – Locality of Reference, Hit Ratio, Writing into Cache – Write Through, Write Back, Input-Output Interface – Purpose, I/O Versus Memory Bus, Isolated versus Memory-Mapped I/O.	R1, R2	

References:

R1: Computer System Architecture by M. Morris Mano, Pearson Education.

R2: Fundamentals of Microprocessors and Microcontroller by B. Ram, Dhanpat Rai Publications.

COURSE OUTCOMES:

After completing this course students will be able to:

CO-1 Understand the basic building blocks of computer system.

CO-2 Design combinational and sequential circuits.

CO-3 Understand the basic architecture and programming of a microprocessor (8085).

CO-4 Demonstrate an understanding of the design of the functional units of a digital computer system.

CO-5 Explain memory hierarchy of a computer system.

Signature of Teacher with Date **Signature of HOD**

GOVT. POLYTECHNIC, HAMIRPUR (H.P.)
Practical Planning

Branch: Computer Engineering **Semester: 3rd**

Subject: Computer System Architecture **Session**: Aug-Dec 2025

Teacher: Mukesh Bhardwaj **Laboratory**: Yes

Sr. No.	No of Practical hours planned	Aim of the Practical	Reference for Procedure/ Writeup	Remarks
1	2	To study AND, OR, NOT logic gates and verify their truth tables.	R1, R2	
2	2	To study NAND, NOR, Ex-OR logic gates and verify their truth tables.	R1, R2	
3	4	To realize basic gates (AND, OR, NOT) using NAND gates only.	R1, R2	
4	2	To realize basic gates (AND, OR, NOT) using NOR gates only	R1, R2	
5	2	To realize DeMorgan's theorem.	R1, R2	
6	2	To design and implement Half adder &Full adder circuit.	R1, R2	
7	2	To design 7-segment decoder driver.	R1, R2	
8	4	To Verify the truth table of S-R and JK flip flops.	R1, R2	
9	2	To design and implement encoder and decoder.	R1, R2	
10	4	Addition and subtraction of two 8 bit numbers.	R1, R2	
11	2	To add two 8-bit numbers resulting in 16 bits sum.	R1, R2	
12	2	To find largest among two numbers.	R1, R2	
13	2	To sort a list of numbers.	R1, R2	

References:

R1: Computer System Architecture, by M. Morris Mano.

R2: Structured Computer Organization, Andrew S. Tanenbaum. Pearson.

Signature of Teacher with Date **Signature of HOD**

GOVT. POLYTECHNIC, HAMIRPUR (H.P.)
Lesson Planning

Branch: Computer Engineering **Semester: 3rd**

Subject: Data Communication & Computer Networks **Session**: Aug-Dec 2025

ourse Code: IoTPC201 **Laboratory**: Yes

Teacher: Varun Gupta

Sr. No.	No of Lectures	Chapter/Unit Description	Detailed contents	Reference Resources	Remarks
1	14 Hrs	Overview of Data Communication	Data Communication, Data Communication Characteristics - Delivery, Accuracy, Timeliness, Jitter; Components of Communication System, Data Flow - Simplex, Half-Duplex, Full-Duplex; Analog and Digital Signals, Peer-to-Peer and Client-Server Networks, Characteristics of Analog Signals - Frequency, Amplitude, Wavelength; Composite Signal, Phase, Bandwidth; Low Pass and Band Pass Channels, Baseband and Broadband Transmission, Data Rate Limit	R1, R2	
2	14 Hrs	Computer Networks	Objectives of Computer Networks, Applications, Network Protocols, Packet Switching, Circuit Switching, Network Topologies, Types of Computer Networks - PAN, LAN, MAN, WAN, Internetworks, Internet - History, Internet Infrastructure, DNS, Internet Routing Hierarchy	R1, R2	
3	14 Hrs	ISO OSI Reference Model	Advantages of Layered Network Architecture, ISO OSI Reference Model, Principles of OSI Reference Model, Functions of OSI Layers, Overview of Basic Protocols at Physical, Data Link, Network and Transport Layers	R1, R2	
4	12 Hrs	Transmission Media and Networking Devices	Wired Media – Coaxial, UTP, STP, Optical Fibre Cables; Wireless Media – Infrared, Radio Waves, Microwaves; Terrestrial and Satellite Wireless Communication; Transmission Impairments, Networking Devices - Repeater, Hub, Bridge, Switch, Router, Gateway, Modem	R1, R2	
5	10 Hrs	TCP/IP Protocol Suite	Layers in TCP/IP Protocol Suite, TCP/IP Protocol Data Units, IPv4 and IPv6 addresses, IPv4 CIDR Notation, Netmasks and Subnets, IPv4 Address Classes and Reserved Ranges, TCP and UDP, Ports, Well-known Ports, Telnet, FTP, SNMP, DHCP and DNS, Overview of Routing - Flooding, Distance Vector, Link State	R1, R2	

Reference Books:

R1. Computer Networks, 4th Edition , Andrew S. Tanenbaum, PHI

R2.Data Communication and Computer Networks by Behrouz Forouzan.

COURSE OUTCOMES:

After completing this course students will be able to:

CO-1. Understand the terminology used in the domain of computer networks.

CO-2. Explain the underlying principles of computer networks.

CO-3. Identify and use common networking devices and cables.

CO-4. Understand the working of TCP/IP as a case study.

Signature of Teacher **Signature of HOD**

Govt. Polytechnic Hamirpur (H.P.)

Lecture Planning (Theory)

Branch : **Computer Engineering** Semester : **3rd**

Subject : **Web Technologies** Session: **Aug-Dec 2025**

Teacher : **Virender Thakur** Laboratory :

Sr. No.	No. of Lectures Planned	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1.	8	Internet and World Wide Web	Brief History of the Internet, Structure of the Internet, Internet Services and Applications, Different Ways to Connect to the Internet, Common Internet Connection Issues and their Solutions, World Wide Web, HTTP, Familiarization with the Key Terms - Network Protocol, Web Server, Web Browser, Website, Web Application, Hypertext, Hyperlink, Search Engine, Proxy Server, URL, DNS	R2,R1,R4	
2.	8	HTML 5	HTML, HTML Coding Conventions, HTML Tag, Structure of HTML Element, Global Attributes - id, class, style, title, tabindex; Structure of a Web Page - <html>, <head>, <body>, <!DOCTYPE>, <title> and <meta> Elements; HTML Comments, Document Object Model (DOM)	R1,R2,R3,R4, R5	

Sr. No.	No. of Lectures Planned	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks

3.	10	HTML Basic Elements	Headings - <h1> … <h6>; Paragraphs - <p>, Special Text Elements - <pre>, <code>, <q>, <var>; Lists : Ordered LIsts ( ), Unordered Lists ( ); Attributes of List, Elements: type, start; Nested Lists, Line Break (
			) and Horizontal Rule (<hr>); Text Formatting Elements - <b>, , , <i>, <mark>, <u>, <sub>, <sup>; Tables - <table>, <thead>, <tbody>, <tfoot>, <tr>, <th>, <td>, <colgroup>, <col>; Table Attributes - cellspacing, cellpadding, border, rowspan, colspan; Images - <img>; Image Attributes - src, alt; Hyperlink - <a>; Hyperlink Attributes - href, target
				R1,R2,R4,R5	

4.	6	HTML Layout Elements	Block and Inline Elements, Creating Sections - , ; Identifying Elements - id, class and name attributes; Frames - <iframe>; HTML5 Semantic Elements - <main>, <header>, <footer>, <article>, <section>, <nav>, <aside>, <details>, <summary>, <time>, <figure>	R1,R2,R5	
5.	8	Cascading Style Sheets	CSS Types - Inline, Internal, External; <style> and <link> elements; CSS Rule, Selector and Declaration; CSS Length Units; CSS Box Model; Setting Margins, Borders and Padding of Elements; CSS Colors - Color Names, RGB and HEX Formats; Setting Colors of Text, Background and Border; Styling Text - font-family, font-size, font-style, font-weight, font-transform, font-decoration, text-align; CSS Layout - position and float; Flexbox and Grid layouts; Styling Tables and Lists; Basic Animation using CSS, CSS Pseudo Elements and Pseudo Classes	R1,R2,R5	

Sr. No.	No. of Lectures Planned	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
6	8	Javascript	Role of Javascript in a Web Page, Embedding Javascript Code in Web Page, Javascript Variables - Naming, Scope and Lifetime, Hoisting; Javascript Operators, Control Statements; Javascript Arrays; Linking External Javascript File; Accessing and Manipulating HTML DOM Elements with Javascript; JavaScript, Builtin Javascript Functions, User-defined Functions	R1,R2,R3,R4, R5,R6	

Course Outcomes:

After completing this course the students will be able to :

CO-1. Understand the Internet and WWW terminology.

CO-2. Utilise the Internet services like email, www and FTP.

CO-3. Connect a computer to the Internet and troubleshoot common network issues.

CO-4. Develop basic static websites using HTML, CSS and Javascript.

Teaching Resources:

R1. Web Technologies - A Computer Science Perspective, Jeffrey C.Jackson,
R2. Web programming - Building Internet Application, Chris Bales
R3. HTML & CSS: Design and Build Websites, John Ducket, Wiley Publishing
R4. https://www.w3schools.com - HTML, CSS and Javascript Tutorials
R5. Mozilla MDN Network Tutorials on HTML, CSS and Javascript
R6. Modern JavaScript Tutorials at https://javascript.info

Signature of Teacher with Date

Signature of H.O.D.

Govt. Polytechnic Hamirpur (H.P.)
Lesson Planning (Practical)

Branch :Comp.Engg. **Semester : 3rd**

Subject : SCA **Session : Aug. 2025-Dec.2025**

Teacher : Nisha kumari

S.No.	No. of Lectures	Description of Activities/Practicals	Remarks
1	6	Painting/Poster Making	
2	6	Prepare presentation on different Topics: Save Enviroment ,Global Warming ,Himachal Pradesh culture	
3	6	Sports/Cultural activity	
4	2	Quiz Competition	
5	3	Newspaper/Magazine Reading	
6	5	Campus beautification/Plantation	
7	4	Art and Carft Activity	

Signature of Teacher **Signature of H.O.D.**