

COMPUTER SCIENCE

**Shree Guru Gobind Singh Ji
Government College Paonta Sahib,
District Sirmour, H.P.**

**Teaching Plan for the session 2022-2023
Department of Computer Science**

Course Title: Problem Solving using Computer

Course Code: – COMP101TH

Total Credits: - 4

Units	Topics	Time /Duration	Activities
UNIT-I	Computer Fundamentals: Introduction to Computers: Characteristics of Computers, Uses of Computers, Types and generations of Computers. Basic Computer Organization: Units of a computer, CPU, ALU, memory hierarchy, registers, I/O devices.	August	1. Assignments 2. Class tests 3. Presentation 4. Practical
UNIT-II	Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation. Techniques of Problem Solving: Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.	September, October	“
UNIT-III	Overview of Programming: Structure of a Python Program, Elements of Python Introduction to Python: Python Interpreter, Using Python as calculator, Python shell, Indentation. Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator). Creating Python Programs: Input and Output Statements, Control statements (Looping while Loop, for Loop,	November, December	“

Ashwani Chandel
AP(CA)



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	Loop Control, Conditional Statement- if...else, Difference between break, continue and pass).		
UNIT- IV	Structures: Numbers, Strings, Lists, Tuples, Dictionary, Date & Time, Modules, Defining Functions, Exit function, default arguments. Introduction to Advanced Python: Objects and Classes, Inheritance, Regular Expressions, Event Driven Programming, GUI Programming.	February, March	“



Ashwani Chandel
APC(A)





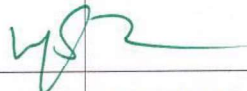
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Course Title: Software Lab using Python

Course Code: – COMP101PR

Total Credits: - 2

Units	Topics	Time /Duration	Activities
UNIT-I	Section: A (Simple programs) 1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice. 2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria : Grade A: Percentage ≥ 80 Grade B: Percentage ≥ 70 and ≤ 60 and ≤ 40 and	August, September	1. Practical
UNIT-II	Section: B (Visual Python): All the programs should be written using user defined functions, wherever possible. 1. Write a menu-driven program to create mathematical 3D objects I. Curve II. Sphere III. Cone IV. Arrow V. Ring VI. Cylinder 2. WAP to read n integers and display them as a histogram.	October, November	“
UNIT-III	All the programs should be written using user defined functions, wherever possible. 3. WAP to display sine, cosine, polynomial and exponential curves. 4. WAP to plot a graph of people with pulse rate p vs. height h. The values of p and h are to be entered by the user.	December	“
UNIT-IV	All the programs should be written using user defined functions, wherever	February, March	“


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possible.		
<p>5. WAP to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula $m=60/(t+2)$, where t is the time in hours. Sketch a graph for t vs. m, where $t \geq 0$.</p> <p>6. A population of 1000 bacteria is introduced into a nutrient medium. The population p grows as follows: $P(t) = (15000(1+t))/(15+e)$ where the time t is measured in hours. WAP to determine the size of the population at given time t and plot a graph for P vs t for the specified time interval.</p>		

AG



WSP


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Course Title: - Office Automation Tools Lab

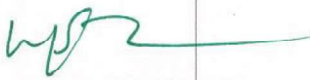
Course Code: – COMP102PR

Total Credits: - 2

Units	Topics	Time /Duration	Activities
UNIT-I and II	<p>Word Processing</p> <p>1. Prepare a grocery list having four columns (Serial number, The name of the product, quantity and price) for the month of April, 06. • Font specifications for Title (Grocery List): 14-point Arial font in bold and italics. • The headings of the columns should be in 12-point and bold. • The rest of the document should be in 10-point Times New Roman. • Leave a gap of 12-points after the title.</p> <p>2. Create a telephone directory. • The heading should be 16-point Arial Font in bold • The rest of the document should use 10-point font size • Other headings should use 10-point Courier New Font. • The footer should show the page number as well as the date last updated.</p> <p>3. Design a time-table form for your college. • The first line should mention the name of the college in 16-point Arial Font and should be bold. • The second line should give the course name/teacher's name and the department in 14-point Arial. • Leave a gap of 12-points. • The rest of the document should use 10-point Times New Roman font. • The footer should contain your specifications as the designer and date of creation.</p> <p>4. BPB Publications plans to release a new book designed as per your syllabus. Design the first page of the book as per the given specifications. • The title of the book should appear in bold using 20-point Arial font. • The name of the author and his qualifications should be in the center of the page in 16-point Arial font. • At the bottom of the document should be the name of the publisher and address in 16-point Times New Roman. • The details of the offices of the publisher (only location) should appear in the footer.</p> <p>5. Create the following one page documents.</p>	August, September, October	1. Practical


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	<p>a. Compose a note inviting friends to a get-together at your house, including a list of things to bring with them.</p> <p>b. Design a certificate in landscape orientation with a border around the document.</p> <p>c. Design a Garage Sale sign. d. Make a sign outlining your rules for your bedroom at home, using a numbered list.</p> <p>6. Create the following documents:</p> <p>(a) A newsletter with a headline and 2 columns in portrait orientation, including at least one image surrounded by text.</p> <p>(b) Use a newsletter format to promote upcoming projects or events in your classroom or college.</p>		
UNIT -III	<p>Spread Sheet</p> <p>1. Given the following worksheet A B C D 1 Roll No. Name Marks Grade 2 1001 Sachin 99 3 1002 Sehwag 65 15 4 1003 Rahul 41 5 1004 Sourav 89 6 1005 Har Bhajan 56 Calculate the grade of these students on the basis of following guidelines: If Marks Then Grade ≥ 80 A+ $\geq 60 < 80$ A $\geq 50 < 60$ B < 50</p> <p>2. Given the following worksheet F A B C D E F G 1 Salesman Sales in (Rs.) 2 No. Qtr1 Qtr2 Qtr3 Qtr4 Total Commission 3 S001 5000 8500 12000 9000 4 S002 7000 4000 7500 11000 5 S003 4000 9000 6500 8200 6 S004 5500 6900 4500 10500 7 S005 7400 8500 9200 8300 8 S006 5300 7600 9800 6100 Calculate the commission earned by the salesmen on the basis of following Candidates: If Total Sales Commission < 20000 0% of sales > 20000 and < 25000 4% of sales > 25000 and < 30000 5.5% of sales > 30000 and < 35000 8% of sales ≥ 35000 11% of sales The total sale is sum of sales of all the four quarters.</p> <p>1. A company XYZ Ltd. pays a monthly salary to its employees which consists of basic salary, allowances & deductions. The details of allowances and deductions are as follows: Allowances ← HRA</p>	November, December	<p>“</p> <p></p> <p>Dr. MOHAN SINGH CHAUHAN Principal Shree Guru Gobind Singh Ji Government College Paonta Sahib Dist. Simlaur (H.P.)-173025</p>





	<p>Dependent on Basic 30% of Basic if Basic \leq 1000 25% of Basic if Basic > 1000 & Basic \leq 3000 20% of Basic if Basic > 3000 \leftarrow DA Fixed for all employees, 30% of Basic \leftarrow Conveyance Allowance Rs. 50/- if Basic is \leq 1000 Rs. 75/- if Basic > 1000 & Basic \leq 2000 Rs. 100 if Basic > 2000 \leftarrow Entertainment Allowance NIL if Basic is \leq 1000 Rs. 100/- if Basic > 1000 Deductions \leftarrow Provident Fund 6% of Basic 16 \leftarrow Group Insurance Premium Rs. 40/- if Basic is \leq 1500 Rs. 60/- if Basic > 1500 & Basic \leq 3000 Rs. 80/- if Basic > 3000 Calculate the following: Gross Salary = Basic + HRA + DA + Conveyance + Entertainment Total deduction = Provident Fund + Group Insurance Premium Net Salary = Gross Salary – Total Deduction</p>		
UNIT-IV	<p>Presentation Tool</p> <ol style="list-style-type: none"> 1. Apply the Banded Design theme to all slides. 2. On Slide 1, add your name in the subtitle text box; change the subtitle text font size to 36 pts. 3. Center align the title and subtitle on Slide 1; change the title text to Californian FB font, 54 pts., Italic. 4. Format the title text on Slide 2 to bold, text shadow effect, and font size 48 pts. 5. On the Banded Slide Master, insert the picture "Logo" in the Computer Technology>PowerPoint folder on the student drive. 6. Resize the image to exactly 1 inch in width and position the image in the lower left corner of the slide so the border of the image rest on the bottom and lower left edges of the slide. 7. On the Title and Text Layout slide master, center align the text in the title placeholder. Close Slide Master view. 8. Change the slide layout of Slide 2 to 	February, March	“


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	Two Content. In the right placeholder, insert an appropriate online picture using the keyword computer.	
	9. Resize the image on Slide 2 to be 2.5 inches in height.	




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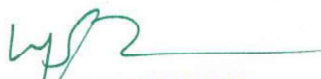
Course Title: -Computer System Architecture

Course Code: – COMP201TH

Total Credits: – 6

Units	Topics	Time /Duration	Activities
UNIT-I	Introduction: Logic gates, Boolean algebra, combinational circuits, circuit simplification, flip flops and sequential circuits, decoders, multiplexors, registers, counters and memory units. Data Representation and basic Computer Arithmetic: Number systems, complements, fixed and floating point representation, character representation, addition, subtraction, magnitude comparison.	August, September	1. Assignments 2. Class tests 3. Presentation
UNIT -II	Basic Computer Organization and Design: Computer registers, bus system, instruction set, timing and control, instruction cycle, memory reference, input-output and interrupt. Central Processing Unit: Register organization, arithmetic and logical micro-operations, stack organization, micro programmed control.	October, November	“
UNIT-III	Programming the Basic Computer: Instruction formats, addressing modes, instruction codes, machine language, and assembly language, input output programming.	December	“
UNIT-IV	Input-output Organization: Peripheral devices, I/O interface, Modes of data transfer, direct memory access.	February, March	“





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Course Title: - Database Management System

Course Code: – COMP202TH

Total Credits: - 4

Units	Topics	Time /Duration	Activities
UNIT-I	Introduction to Database Management Systems: Characteristics of database approach, data models, DBMS architecture and data independence.	August, September	1. Assignments 2. Class tests 3. Presentation 4. Practical
UNIT-II	Entity Relationship and Enhanced ER Modeling: Entity types, relationships, SQL99: Schema Definition, constraints, and object modeling.	October, November	“
UNIT-III	Relational Data Model : Basic concepts, relational constraints, relational algebra, SQL queries.	December	“
UNIT-IV	Database design: ER and EER to relational mapping functional dependencies, normal forms up to third normal form.	February, March	“



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Course Title: - Database Management System Lab

Course Code: – COMP202PR

Total Credits: - 2

Units	Topics	Time /Duration	Activities
UNIT-I	DDL Commands • Create table, alter table, drop table DML Commands • Select, update, delete, insert statements • Condition specification using Boolean and comparison operators (and, or, not, =, <, >, <=, >=) •	August, September	1. Practical
UNIT-II	Arithmetic operators and aggregate functions (Count, sum, avg, Min, Max) • Multiple table queries (join on different and same tables) •	October, November	“
UNIT-III	Nested select statements • Set manipulation using (any, in, contains, all, not in, not contains, exists, not exists, union, intersect, minus, etc.) •	December	“
UNIT-IV	Categorization using group by.....having Arranging using order by	February, March	“

Course Title: PHP Programming

Course Code: – COMP203TH

Total Credits: - 4

Units	Topics	Time /Duration	Activities
UNIT-I	Introduction to PHP: PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.), PHP with other technologies, scope of PHP, Basic Syntax, PHP variables and constants, Types of data in PHP, Expressions, scopes of a variable (local, global), PHP Operators : Arithmetic, Assignment, Relational, Logical operators, Bitwise, ternary and MOD operator, PHP operator Precedence and associativity	August, September	1. Assignments 2. Class tests 3. Presentation 4. Practical
UNIT	Handling HTML form with PHP: Capturing Form Data, GET and POST form methods, Dealing with multi value	October, November	“

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-II	fields, Redirecting a form after submission. PHP conditional events and Loops: PHP IF Else conditional statements (Nested IF and Else), Switch case, while, For and Do While Loop, Goto, Break, Continue and exit.		
UNIT-III	PHP Functions: Function, Need of Function, declaration and calling of a function, PHP Function with arguments, Default Arguments in Function, Function argument with call by value, call by reference, Scope of Function Global and Local Array: Anatomy of an Array ,Creating index based and Associative array ,Accessing array, Looping with Index based array, with associative array using each() and for each(), Some useful Library function.	December	“
UNIT-IV	String Manipulation and Regular Expression: Creating and accessing String , Searching & Replacing String, Formatting, joining and splitting String , String Related Library functions, Use and advantage of regular expression over inbuilt function, Use of preg_match(), preg_replace(), preg_split() functions in regular expression	February, March	“

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Course Title: - Operating- System

Course Code: – COMP301TH

Total Credits: – 6

Units	Topics	Time /Duration	Activities
UNIT-I	Introduction: System Software, Resource Abstraction, OS strategies. Types of operating systems - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems.	August, September	1. Assignments 2. Class tests 3. Presentation
UNIT-II	Operating System Organization: Factors in operating system design, basic OS functions, implementation consideration; process modes, methods of requesting system services – system calls and system programs. Process Management : System view of the process and resources, initiating the OS, process address space, process abstraction, resource abstraction, process hierarchy, Thread model Scheduling : Scheduling Mechanisms, Strategy selection, non-pre-emptive and pre-emptive strategies	October, November	“
UNIT-III	Memory Management: Mapping address space to memory space, memory allocation strategies, fixed partition, variable partition, paging, virtual memory	December	“
UNIT-IV	Shell introduction and Shell Scripting: shell and various type of shell, Various editors present in Linux, Different modes of operation in vi editor, What is shell script, Writing and executing the shell script, Shell variable (user defined and system variables), System calls, Using system calls	February, March	“




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Course Title: - Data Structure and File Processing

Course Code: – COMP302TH

Total Credits: - 4

Units	Topics	Time /Duration	Activities
UNIT-I	Basic Data Structures: Abstract data structures- stacks, queues, linked lists and binary trees. Binary trees, balanced trees.	August, September	1. Assignments 2. Class tests 3. Presentation 4. Practical
UNIT-II	Searching: Internal and external searching, Memory Management: Garbage collection algorithms for equal sized blocks, storage allocation for objects with mixed size.	October	“
UNIT-III	Physical Devices: Characteristics of storage devices such as disks and tapes, I/O buffering. Basic File System Operations: Create, open, close, extend, delete, read-block, write-block, protection mechanisms.	November, December	“
UNIT-IV	File Organizations: Sequential, indexed sequential, direct, inverted, multi-list, directory systems, Indexing using B-tree, B+ tree.	February, March	“



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Course Title:- Data Structure and File Processing Lab

Course Code: – COMP302PR

Total Credits: - 2

Units	Topics	Time /Duration	Activities
UNIT-I	1. Write a program to implement PUSH and POP operations of stack using arrays. 2. Implement Singly Link List programs - for Insertion, Deletion, searching and traversing.	August, September	1. Practical
UNIT-II	3. Write a program to implement PUSH and POP operations of stack using Link list. 4. Write a program to implement Binary Tree using Link List.	October	“
UNIT-III	5. Write a program to count the number of nodes in a link list. 6. Implement Queue programs – for insertion and deletion using arrays.	November, December	“
UNIT-IV	7. Implement Queue programs – for insertion and deletion using Link List. 8. Write a program to delete duplicate elements from an array of 20 integers.	February, March	“





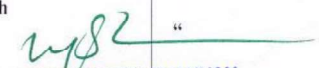
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Course Title: Software Engineering

Course Code: – COMP303TH

Total Credits: - 4


Units	Topics	Time /Duration	Activities
UNIT-I	Software Process: Introduction ,S/W Engineering Paradigm , life cycle models (water fall, incremental, spiral, evolutionary, prototyping, object oriented) , System engineering, computer based system, verification, validation, life cycle process, development process, system engineering hierarchy. Software requirements: Functional and non-functional , user, system, requirement engineering process, feasibility studies, requirements, elicitation, validation and management, software prototyping, prototyping in the software process, rapid prototyping techniques, user interface prototyping, S/W document. Analysis and modeling, data, functional and behavioral models, structured analysis and data dictionary	August, September	1. Assignments 2. Class tests 3. Presentation
UNIT –II	Design Concepts and Principles: Design process and concepts, modular design, design heuristic, design model and document, Architectural design, software architecture, data design, architectural design, transform and transaction mapping, user interface design, user interface design principles. Real time systems, Real time software design, system design, real time executives, data acquisition system, monitoring and control system.	October, November	“
UNIT-III	Software Configuration Management: The SCM process, Version control, Change control, Configuration audit, SCM standards. Software Project Management: Measures and measurements, S/W complexity and science measure, size measure, data and logic structure measure, information flow measure. Estimations for Software Projects, Empirical Estimation Models, Project Scheduling.	December	“
UNIT-IV	Testing: Taxonomy of software testing, levels, test activities, types of s/w test, black box testing testing boundary conditions,	February, March	“


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	structural testing, test coverage criteria based on data flow, mechanisms, regression testing, testing in the large. S/W testing strategies, strategic approach and issues, unit testing, integration testing, validation testing, system testing and debugging. Trends in Software Engineering: Reverse Engineering and Re-engineering – wrappers – Case Study of CASE tools.		
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