SBP DAV CENTENARY PUBLIC SCHOOL, FATEHABAD

COMPUTER SCIENCE (2023-24)

CLASS XI

Month	Unit	Content /Activities/ Pratcical
April	**Chapter 1** **Computer System Overview**	**Basic computer organisation**: Introduction to Computer System, hardware, software, input device, output device, CPU, memory (primary, cache and secondary), units of memory (bit, byte, KB, MB, GB, TB, PB) ● Types of software: System software (Operating systems, system utilities, device drivers), programming tools and language translators (Assembler, compiler, and interpreter), application software ● Operating System(OS): functions of the operating system, OS user interface
May	**Chapter 2** **Data Representation** **Chapter 3** **Boolean Logic**	● Number System: Binary, Octal, Decimal and Hexadecimal number system; conversion between number systems ● Encoding Schemes: ASCII, ISCII, and Unicode (UTF8, UTF32) ● Boolean logic: NOT, AND, OR, NAND, NOR, XOR, NOT, truth tables and De Morgan's laws, Logic circuits
June	Summer Vacation	
July	**Chapter 4** **Introduction to Problem Solving** **Chapter 5** **Getting Started with Python** **Chapter 6** **Python Fundamentals**	● Introduction to Problem-solving: Steps for Problem-solving (Analyzing the problem, developing an algorithm, coding, testing, and debugging), representation of algorithms using flowchart and pseudocode, decomposition ● Familiarization with the basics of Python programming: Introduction to Python, Features of Python, executing a simple "hello world" program, execution modes: interactive mode and script mode, ● Python character set, Python tokens(keyword, identifier, literal, operator, punctuator), variables, concept of l-value and r-value, use of comments
August	**Chapter 7** **Data Handling**	● Knowledge of data types: Number(integer, floating point,complex), boolean, sequence(string, list, tuple), None, Mapping(dictionary), mutable and immutable data types. ● Operators: arithmetic operators, relational operators, logical operators, assignment operators, augmented assignment operators, identity operators (is, is not), membership operators (in not in) ● Expressions, statement, type conversion, and input/output: precedence of operators, expression, evaluation of an expression, type-conversion (explicit and implicit conversion), accepting data as input from the console and displaying output. ● Errors- syntax errors, logical errors, and run-time errors

	Chapter 8 **Flow of Control**	● Flow of Control: introduction, use of indentation, sequential flow, conditional and iterative flow ● Conditional statements: if, if-else, if-elif-else, flowcharts, simple programs: e.g.: absolute value, sort 3 numbers and divisibility of a number. ● Iterative Statement: for loop, range(), while loop, flowcharts, break and continue statements, nested loops, suggested programs: generating pattern, summation of series, finding the factorial of a positive number, etc.
September	Half Yearly Exams	
October	**Chapter 9** **String Manipulation** **Chapter 10** **List Manipulation**	● Strings: introduction, string operations (concatenation, repetition, membership and slicing), traversing a string using loops, built-in functions/methods–len(), capitalize(), title(), lower(), upper(), count(), find(), index(), endswith(), startswith(), isalnum(), isalpha(), isdigit(), islower(), isupper(), isspace(),lstrip(), rstrip(), strip(), replace(), join(), partition(), split() ● Lists: introduction, indexing, list operations (concatenation, repetition, membership and slicing), traversing a list using loops, built-in functions/methods–len(), list(), append(), extend(), insert(), count(), index(), remove(), pop(), reverse(), sort(), sorted(), min(), max(), sum(); nested lists, suggested programs: finding the maximum, minimum, mean of numeric values stored in a list; linear search on list of numbers and counting the frequency of elements in a list.
November	**Chapter 11 Tuples** **Chapter 12** **Dictionaries**	● Tuples: introduction, indexing, tuple operations (concatenation, repetition, membership and slicing); built-in functions/methods – len(), tuple(), count(), index(), sorted(), min(), max(), sum(); tuple assignment, nested tuple; suggested programs: finding the minimum, maximum, mean of values stored in a tuple; linear search on a tuple of numbers, counting the frequency of elements in a tuple. ● Dictionary: introduction, accessing items in a dictionary using keys, mutability of a dictionary (adding a new term, modifying an existing item), traversing a dictionary, built-in functions/methods – len(), dict(), keys(), values(), items(), get(), update(), del(), del, clear(), fromkeys(), copy(), pop(), popitem(), setdefault(), max(), min(), sorted(); Suggested programs: count the number of times a character appears in a given string using a dictionary, create a dictionary with names of employees, their salary and access them. ● Introduction to Python modules: Importing module using 'import <module>' and using from statement, importing math module (pi, e, sqrt(), ceil(), floor(), pow(), fabs(), sin(), cos(), tan()); random module (random(), randint(), randrange()), statistics module (mean(), median(), mode()).

December	**Chapter 14 Cyber Safety** **Chapter 15 Online Acess and Computer Security** **Chapter 16 Society, Law & Ethics**	● Digital Footprints ● Digital Society and Netizen: net etiquettes, communication etiquettes, social media étiquettes ● Data Protection: Intellectual property rights (copyright, patent , trademark), violation of IPR(plagiarism, copyright infringement, trademark infringement), open source software and licensing (Creative Commons, GPL and Apache) ● Cyber Crime: definition, hacking, eavesdropping, phishing and fraud emails, ransomware, cyber trolls, cyber bullying ● Cyber safety: safely browsing the web, identity protection, confidentiality ● Malware: viruses, trojans, adware ● E-waste management: proper disposal of used electronic gadgets. ● Information Technology Act (IT Act) ● Technology and society: Gender and disability issues while teaching and using computers
January	Preboard Exams	
February	Annual Exams	
March	Annual Exams	

Practical List

Python Programming

1. Input a welcome message and display it.
2. Input two numbers and display the larger / smaller number.
3. Input three numbers and display the largest / smallest number.
4. Generate the following patterns using nested loops:

Pattern-1	Pattern-2	Pattern-3
* ** *** **** *****	12345 1234 123 12 1	A AB ABC ABCD ABCDE

5. Write a program to input the value of x and n and print the sum of the following series:

- $1 + x + x^2 + x^3 + x^4 + \cdots x^n$
- $1 - x + x^2 - x^3 + x^4 - \cdots x^n$
- $x + \frac{x^2}{2} + \frac{x^3}{3} + \frac{x^4}{4} + \cdots \frac{x^n}{n}$
- $x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \cdots \frac{x^n}{n!}$

6. Determine whether a number is a perfect number, an Armstrong number or a palindrome.
7. Input a number and check if the number is a prime or composite number.
8. Display the terms of a Fibonacci series.

9. Compute the greatest common divisor and least common multiple of two integers.
10. Count and display the number of vowels, consonants, uppercase, lowercase characters in string.
11. Input a string and determine whether it is a palindrome or not; convert the case of characters in a string.
12. Find the largest/smallest number in a list/tuple
13. Input a list of numbers and swap elements at the even location with the elements at the odd location.
14. Input a list/tuple of elements, search for a given element in the list/tuple.
15. Create a dictionary with the roll number, name and marks of n students in a class and display the names of students who have marks above 75.