DELHI PUBLIC SCHOOL, JAMMU
SYLLABUS BIFURCATION
SESSION: 2023-24

Class: XI   Subject: Computer Science (083)

Objectives:
- develop basic computational thinking
- explain and use data types
- appreciate the notion of algorithm
- develop a basic understanding of computer systems – architecture, operating system and cloud computing
- explain cyber ethics, cyber safety and cybercrime
- Understand the value of technology in societies along with consideration of gender and disability issues

S.No	Month	Name of units
1	April	**Unit I: Computer Systems and Organisation** • 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 & interpreter), application software • Operating system (OS): functions of operating system, OS user interface • Boolean logic: NOT, AND, OR, NAND, NOR, XOR, truth table, De Morgan's laws and logic circuits • Number system: Binary, Octal, Decimal and Hexadecimal number system; conversion between number systems. • Encoding schemes: ASCII, ISCII and UNICODE (UTF8, UTF32) **Activity-1:-** To find the equivalent of one base to another base.
2	May	**Unit II: Computational Thinking and Programming -1** • Introduction to problem solving: Steps for problem solving (analysing the problem, developing an algorithm, coding, testing and debugging). representation of algorithms using flow chart and pseudo code, 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 • 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 operator, augmented assignment operators, identity operators(is, is not), membership operators(in, not in) • Expressions, statement, type conversion & input/output: precedence of operators, expression, evaluation of expression, python statement, type conversion (explicit & implicit conversion), accepting data as input from the console and displaying output • Errors: syntax errors, logical errors, runtime errors • Flow of control: introduction, use of indentation, sequential flow, conditional and iterative flow control • Conditional statements: if, if-else, if-elif-else, flowcharts, simple programs: e.g.: absolute value, sort 3 numbers and divisibility of a number • Iterative statements: for loop, range function, while loop, flowcharts, break and continue statements, nested loops, suggested programs: generating pattern, summation of series, finding the factorial of a positive number etc **Worksheet on expression writing -** to test the knowledge of students.

3	June	**Unit II: Computational Thinking and Programming -1** **Class test-1:-** To evaluate the understanding of abstract concepts of the students on the topic Boolean Algebra, Logic Gates and Number system. **Team exercise (Power point presentation)** on System Organisation.
4	July	Unit II: Computational Thinking and Programming -1 • <u>Strings:</u> introduction, indexing, string operations (concatenation, repetition, membership & slicing), traversing a string using loops, built-in functions: len(), capitalize(), title(), lower(), upper(), count(), find(), index(), endswith(), startswith(), isalnum(), isalpha(), isdigit(), islower(), isupper(), isspace(), lstrip(), rstrip(), strip(), replace(), join(), partition(), split() **Foundation worksheet** on strings and iterative statements for the revision of previous concepts. **Assignment-1** on the topic Conditional statements.
5	August	• **Unit II: Computational Thinking and Programming -1** <u>Lists:</u> introduction, indexing, list operations (concatenation, repetition, membership & slicing), traversing a list using loops, built-in functions: 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 **Experiential learning: -** To enhance the knowledge and skill of the students. **Assignment-2** on the topic Lists in Python **Sample paper -1:** **Topics:** 1. **Lists** 2. **Strings** 3. **Conditional and Iterative statements** 4. **Boolean Algebra** 5. **Computer system and Organisation**
6	September	<u>Tuples</u>: introduction, indexing, tuple operations (concatenation, repetition, membership & slicing), built-in functions: 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 **Kahoot quiz** on the topic Tuples in Python. **Experiential learning** to enhance the knowledge and skill of the students.
7	October	• <u>Dictionary:</u> introduction, accessing itemsin a dictionary using keys, mutability of dictionary (adding a new item, modifying an existing item), traversing a dictionary, built-in functions: len(), dict(), keys(), values(), items(), get(), update(), del, clear(), fromkeys(), copy(), pop(), popitem(), setdefault(), max(), min(), count(), sorted(), copy(); 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 **Assignment-3** on the topics Tuples and Dictionary in Python. **Class test-3:-** To evaluate the understanding of the students.
8	November	• Introduction to Python modules: Importing module using 'import ' 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) **Kahoot quiz** on the topic Dictionaries and Modules in Python . ❖ **Activity-:-** Practical based of topic Dictionary in Python
9	December	**Unit III: Society, Law and Ethics** ❖ Digital Footprints ❖ Digital society and Netizen: net etiquettes, communication etiquettes, social media etiquettes ❖ Data protection: Intellectual Property Right (copyright, patent, trademark),

		violation of IPR (plagiarism, copyright infringement, trademark infringement), open source softwares and licensing (Creative Commons, GPL and Apache)
		❖ Cyber-crime: definition, hacking, eavesdropping, phishing and fraud emails, ransomware, preventing cyber crime
		❖ Cyber safety: safely browsing the web, identity protection, confidentiality, cyber trolls and bullying.
		Sample paper -1:
		Topics:
		1. **Lists**
		2. **Strings**
		3. **Conditional and Iterative statements**
		4. **Boolean Algebra**
		5. **Computer system and Organisation**
		6. **Tuples**
		7. **Dictionary**
10	January	➤ **Case study questions**
11	February	➤ **Revision**
12	March	➤ **Revision**

Exam Schedule:

Syllabus of Formative Assessment-1:

1. Computer system and Organisation

2. Boolean Algebra and Number System

Syllabus of Half –Yearly:

1. Computer system and Organisation

2. Boolean Algebra and Number System

3. Introduction to Python fundamentals

4. Operators and Conditional Statements

5. Iterative Statements and Strings in Python

Syllabus of Formative Assessment-2:

1. Computer system and Organisation

2. Boolean Algebra and Number System

3. Introduction to Python fundamentals

4. Operators and Conditional Statements

5. Iterative Statements and Strings in Python

6. Lists in Python

Syllabus for Final Examination:

1. Computer system and Organisation

2. Boolean Algebra and Number System

3. Introduction to Python fundamentals

4. Operators and Conditional Statements

5. Iterative Statements and Strings in Python

6. Lists in Python

7. Tuples in Python

8. Dictionary in Python

9. Society, Law and Ethics

Subject Coordinator