KENDRIYA VIDYALAYA SANGATHAN
MUMBAI REGION
SPLIT–UP SYLLABUS
SESSION 2019-20

CLASS: XI **SUBJECT: COMPUTER SCIENCE (083)**

S.NO.	Month	Name of Lesson	Tentative No. of Theory Periods Required	Tentative No. of Practical Periods Required	Tentative No. of Working days
1.	April-May	----------------	-----------		-----------
2.	June	**Unit 2 : Programming and Computational Thinking (PCT-1)** • Basics of Computational Thinking: Decomposition, Pattern Recognition/ Data representation, Generalization/ Data Abstraction and algorithm. Basic concepts of flowchart. • Familiarization with the basics of Python programming: a simple "hello world" program, process of writing a program, (Interactive & Script mode), running it, and print statements; simple data-types: integer, float, string	08	04	08
3.	July	• Features of Python, Python Character Set, Token & Identifiers, Keywords, Literals, Delimiters, operators. • Comments: (Single line & Multiline/ Continuation statements), Clarity & Simplification of expression • Introduce the notion of a variable, and methods to manipulate it (concept of L-value and R-value even if not taught explicitly) • Knowledge of data types and operators: accepting input from the console, assignment statement, expressions, operators and their precedence. • Operators & types: Binary operators-Arithmetic, Relational operators, Logical Operators, Augmented Assignment operators. • Conditional statements: if, if-else, if-elif-else; simple programs: e.g.: absolute value, sort 3 numbers, divisibility.	21	20	26
4.	August	• Notion of iterative computation and control flow: for, while, flowcharts, decision trees and pseudo code; write a lot of programs: interest calculation, primarily testing, factorials etc. • Idea of debugging: errors and exceptions; debugging: pdb, break	28	24	23

		points.			
5.	September	• Lists, tuples and dictionary: finding the maximum, minimum, mean; linear search on list/tuple of numbers, and counting the frequency of elements in a list using a dictionary. Introduce the notion of accessing elements in a collection using numbers and names. • Sorting algorithm: bubble and insertion sort; count the number of operations while sorting • Strings: Traversing, compare, concat, substring; • Introduction to Python modules: Importing math (sqrt, cell, floor, pow, fabs, sin, cos, tan, random (random, randint, randrange), statistics (mean, median,mode) modules.	23	22	22
6.	October	**Unit 1: Computer Systems and Organisation (CSO)** • Basic computer organisation: description of a computer system and mobile system, CPU, memory, hard disk, I/O, battery, power. • Types of software: application, System, utility. • Memory Units: bit, byte, MB, GB, TB, and PB. • Boolean logic: OR, AND, NAND, NOR, XOR, NOT, truth tables, De Morgan's laws difference between a compiler and an interpreter	06	-----	18
7.	November	• Information representation: numbers in base 2, 8, 16, unsigned integers, binary addition • Strings: ASCII, UTF8, UTF32, ISCII (Indian script code), UNICODE • Execution of a program: basic flow of compilation–program->binary-> execution • Interpreters (process one line at a time), • Running a program: Notion of an operating system, how an operating system runs a program, idea of loading, operating system as a resource manager. • Concept of cloud computers, cloud storage (public/private), and introduction to parallel computing.	14	06	23
8.	December	**<u>Unit 3: Data Management (DM-1)</u>** • Relational databases: Concept of a database, relations, attributes and tuples, keys- candidate key, primary	12	06	18

		key, alternate key, foreign key; Degree and cardinality of a table. • Use SQL – DDL/ DML commands to CREATE TABLE, INSERT INTO, UPDATE TABLE , DELETE FROM, ALTER TABLE,MODIFY TABLE, DROP TABLE, keys, and foreign keys; to view content of a table: SELECT-FROM WHERE			
9.	January	• ORDER BY along with BETWEEN, IN, LIKE, (Queries only on single table) • Aggregate functions – MIN, MAX, AVG, COUNT, SUM • Basics of NoSQL databases.	18	18	23
10.	February	**Unit 4: Society, Law and Ethics (SLE-1) - Cyber safety** • Cyber safety: safely browsing the web, identity protection, confidentiality, social networks, cyber trolls and bullying. • Appropriate usage of social networks: spread of rumours, and common social networking sites (Twitter, LinkedIn, and Facebook) and specific usage rules. • Safely accessing web sites: adware, malware, viruses, Trojans. • Safely communicating data: secure connections, eavesdropping, and phishing and identity verification. • **Revision and Practice of Sample Question Papers**	10	------	23
11	March	**SESSION ENDING EXAMINATION**			
TOTAL			**140 Theories**	**100 Practical**	

Note: Teachers have to arrange periods as per their availability of time for project work.

CLASS: XII   SUBJECT: COMPUTER SCIENCE (083)

S.NO.	Month	Name of Lesson	Tentative No. of Theory Periods Required	Tentative No. of Practical Periods Required	Tentative No. of Working days
1.	April-May	**Unit 1: Programming and Computational Thinking (PCT-2)** • Revision of the basics of Python • Functions: scope, parameter passing, mutable/immutable properties of data objects, pass arrays to functions, return values, functions using libraries: mathematical, and string functions.	20	15	24
2.	June - July	**Unit 1: Programming and Computational Thinking (PCT-2)** • File handling: open and close a file, read, write, and append to a file, standard input, output, and error streams, relative and absolute paths. • Using Python libraries: create and import Python libraries	25	20	35
4.	August	**Unit 1: Programming and Computational Thinking (PCT-2)** • Recursion: simple algorithms with recursion: factorial, Fibonacci numbers; recursion on arrays: binary search • Idea of efficiency: performance defined as inversely proportional to the wall clock time, count the number of operations a piece of code is performing, and measure the time taken by a program. Example: take two different programs for the same problem, and understand how the efficient one takes less time. • Data visualization using Pyplot: line chart, pie chart, and bar chart. • Data-structures: lists, stacks, queues.	35	10	23
5.	Sept	**Unit 2: Computer Networks (CN)** • Structure of a network: Types of networks: local area and wide area (web and internet), new technologies such as cloud and IoT, public vs. private cloud, wired and wireless networks; concept of a client and server. • Network devices such as a NIC, switch, hub, router, and access point. • Network stack: amplitude and frequency	20	05	22

		modulation, collision in wireless networks, error checking, and the notion of a MAC address, main idea of routing. IP addresses: (v4 and v6), routing table, router, DNS, and web URLs, TCP: basic idea of retransmission, and rate modulation when there is congestion (analogy to a road network), Protocols: 2G, 3G, 4G, WiFi. What makes a protocol have a higher bandwidth			
6.	October	**Unit 2: Computer Networks (CN) contd** • Basic network tools: traceroute, ping, ipconfig, nslookup, whois, speed-test. • Application layer: HTTP (basic idea), working of email, secure communication: encryption and certificates (HTTPS), network applications: remote desktop, remote login, HTTP, FTP, SCP, SSH, POP/IMAP, SMTP, VoIP, NFC.	10	05	18
		Unit 3: Data Management (DM-2) • Write a minimal Django based web application that parses a GET and POST request, and writes the fields to a file - flat file and CSV file. • Interface Python with an SQL database	12	05	
7.	Nov	**Unit 3: Data Management (DM-2) contd** • SQL commands: aggregation functions – having, group by, order by. **Unit 4: Society, Law and Ethics (SLE-2)**	08	05	23
		• Intellectual property rights, plagiarism, digital rights management, and licensing (Creative Commons, GPL and Apache), open source, open data, privacy. • Privacy laws, fraud; cyber-crime-phishing, illegal downloads, child pornography, scams; cyber forensics, IT Act, 2000. • Technology and society: understanding of societal issues and cultural changes induced by technology. • E-waste management: proper disposal of used electronic gadgets. • Identity theft, unique ids, and biometrics. • Gender and disability issues while teaching and using computers **Revision and Practice of Sample Question Papers**	12	-----	
8.	Dec	**1st Pre-Board Examination & Revision.**			
9.	Jan	**2nd Pre-Board Examination & Revision.**			
10.	Feb	**CBSE Practical Examination**			
11.	March	**CBSE Board Examination**			

Note: Teachers have to arrange periods as per their availability of time for project work.