SPLIT-UP SYLLABUS FOR COMPUTER SCIENCE (083)

CLASS - XII (NEW SYLLABUS)

(Session 2019 - 20 onward)

DISTRIBUTION OF MARKS

UNIT	UNIT NAME	MARKS
1	Programming and Computational Thinking-2	30
2	Computer Network	15
3	Data Management-2	15
4	Society, Law and Ethics-2	10
5	Practicals	30
	TOTAL	**100**

MONTH- WISE DISTRIBUTION

Month	Topics to be covered	Th.	Pr.
June-July	**Unit 1: Programming and Computational Thinking-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. • File handling: open and close a file, read, write, and append to a file, standard input, output, and error streams, relative and absolute paths.	40	35
August	• Using Python libraries: create and import Python libraries • 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.	40	35
September	**Unit 2: Computer Network (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 modulation, collision in wireless networks, error checking, and the notion of a MAC	30	10

	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, Wi-Fi. What makes a protocol have a higher bandwidth? • 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.		
	HALF YEARLY EXAMINATION		
October	**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 • SQL commands: aggregation functions – having, group by, order by.	20	20
November	**UNIT 4: Society , Law and Ethics (SLE-2)** • 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.	10	
December-January	**Revision, Project Work & Pre-Board Examination**		
February	**Revision & AISSCE Practical Examination**		

GUIDELINES FOR PRACTICAL WORK
COMPUTER SCIENCE (065)
CLASS - XII (NEW SYLLABUS)
DISTRIBUTION OF MARKS

S.No.	UNIT NAME	MARKS
1	**Lab Test (10 marks)**	
	Python programs to test PCT (60% logic + 20% documentation +20% code quality)	7
	Small Python program that sends a SQL query to a database and displays the result. A stub program can be provided.	3
2	**Report File + viva (09 marks)**	
	Report file: Minimum 21 Python programs. Out of this at least 4 programs should send SQL commands to a database and retrieve the result; at least 1 program should implement the web server to write user data to a CSV file.	7
	Viva voce (based on the report file)	2
3	**Project + viva (11 marks) ***	
	Project Work (that uses most of the concepts that have been learnt)	8
	Project Viva Voce.	3

*Refer CBSE Curriculum for detailed guidelines for Project work.

Programming in Python:
- Recursively find the factorial of a natural number.
- Read a file line by line and print it.
- Remove all the lines that contain the character `a' in a file and write it to another file.
- Write a Python function sin(x, n) to calculate the value of sin(x) using its Taylor series expansion up to n terms. Compare the values of sin(x) for different values of n with the correct value.
- Write a random number generator that generates random numbers between 1 and 6 (simulates a dice).
- Write a recursive code to find the sum of all elements of a list.
- Write a recursive code to compute the nth Fibonacci number.
- Write a Python program to implement a stack and queue using a list data-structure.
- Write a recursive Python program to test if a string is a palindrome or not.
- Write a Python program to plot the function y = x^2 using the pyplot or matplotlib libraries.
- Create a graphical application that accepts user inputs, performs some operation on them, and then writes the output on the screen. For example, write a small calculator. Use the tkinter library.
- Open a webpage using the urllib library.
- Compute EMIs for a loan using the numpy or scipy libraries.
- Take a sample of 10 phishing e-mails and find the most common words.

Data Management: SQL & Web Server:
- Find the min, max, sum, and average of the marks in a student marks table.
- Find the total number of customers from each country in the table (customer ID, customer name, country) using group by.
- Write a SQL query to order the (student ID, marks) table in descending order of the marks.
- Integrate SQL with Python by importing the MySQL module
- Write a Django based web server to parse a user request (POST), and write it to a CSV file.