

SPLIT-UP SYLLABUS FOR COMPUTER SCIENCE (083)

CLASS - XI (NEW SYLLABUS)

(SESSION 2018-19 ONWARD)

DISTRIBUTION OF MARKS

UNIT	UNIT NAME	MARKS
1	Programming and Computational Thinking-1	35
2	Computer System and Organization	10
3	Data Management-1	15
4	Society, Law and Ethics-1	10
5	Practicals	30
	TOTAL	100

MONTH- WISE DISTRIBUTION

Month	Topics to be covered	Th.	Pr.
June-July	Unit 1: Programming and Computational Thinking (PCT-1) <ul style="list-style-type: none">Familiarization with the basics of Python programming: a simple "hello world" program, process of writing a program, running it, and print statements; simple data-types: integer, float, string.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.Conditional statements: if, if-else, if-elif-else; simple programs: e.g.: absolute value, sort 3 numbers, divisibility.Notion of iterative computation and control flow: for, while, flowcharts, decision trees and pseudo code; write a lot of programs: interest calculation, primarily testing, and factorials.Idea of debugging: errors and exceptions; debugging: pdb, break points.	30	25
August	<ul style="list-style-type: none">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.	25	25
September	<ul style="list-style-type: none">Sorting algorithm: bubble and insertion sort; count the number of operations while sorting.Strings: compare, concat, substring; notion of states and transitions using state transition diagrams.	25	20
October	HALF YEARLY EXAMINATION		
	Unit 2: Computer Systems and Organization (CSO) <ul style="list-style-type: none">Basic computer organisation: description of a computer system and mobile system, CPU, memory, hard disk, I/O, battery, power.Types of software: application, OS, utility, libraries.Language of Bits: bit, byte, MB, GB, TB, and PB.Information representation: numbers in base 2, 8, 16, unsigned integers, binary additionStrings: ASCII, UTF8, UTF32, ISCII (Indian script code)	10	06

November	<ul style="list-style-type: none"> • Boolean logic: OR, AND, NAND, NOR, XOR, NOT, truth tables, De Morgan's laws • Execution of a program: basic flow of compilation – program->binary-> execution • Interpreters (process one line at a time), difference between a compiler and an interpreter • 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 brief introduction to parallel computing. 	10	
December	<p>Unit 3: Data Management (DM-1)</p> <ul style="list-style-type: none"> • Relational databases: idea of a database and the need for it, relations, keys, primary key, foreign key; use SQL commands to create a table, keys, foreign keys; insert/delete an entry, delete a table. • SQL commands: select, project, and join; indexes, and a lot of in-class practice. • Basic of NoSQL Databases- MongoDB 	30	24
January	<p>UNIT 4: Society , Law and Ethics (SLE-1)- Cyber Safety</p> <ul style="list-style-type: none"> • 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. 	10	
February	Revision, Project Work , Session Ending Practical Examination		

GUIDELINES FOR PRACTICAL WORK

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S.No.	UNIT NAME	MARKS
1	Lab Test (12 marks)	
	Python programs to test PCT (60% logic + 20% documentation +20% code quality)	8
	SQL program (at least 4 queries)	4
2	Report File + viva (10 marks)	
	Report file: Minimum 20 Python programs (PCT + DH) and at least 8 SQL commands	7
	Viva voce (based on the report file)	3
3	Project Work (that uses most of the concepts that have been learnt) Project may be allotted to group of 2-3 students.	8

Programming in Python: At least the following Python concepts should be covered in the lab sessions: expressions, conditionals, loops, list, dictionary, and strings. The following are some representative lab assignments.

- Find the largest and smallest numbers in a list.
- Find the third largest number in a list.
- Test for primality
- Find whether a string is a palindrome or not.
- Given two integers x and n , compute x^n .
- Compute the greatest common divisor and the least common multiple of two integers.
- Test if a number is equal to the sum of the cubes of its digits. Find the smallest and largest such numbers.

Data Management: SQL Commands At least the following SQL commands should be covered during the labs: create, insert, delete, select, and join. The following are some representative assignments.

- Create a student table with the student id, name, and marks as attributes where the student id is the primary key.
- Insert the details of a new student in the above table.
- Delete the details of a particular student in the above table.
- Use the select command to get the details of the students with marks more than 80.
- Create a new table (name, date of birth) by joining two tables (student id, name) and (student id, date of birth).
- Create a new table (order ID, customer Name, and order Date) by joining two tables (order ID, customer ID, and order Date) and (customer ID, customer Name, contact Name, country).

SUGGESTIVE LIST OF PROGRAMS (LAB WORK)

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[Minimum 20 Programs from Python Programming & 8 SQL queries - covering all the topics must be tested in the Lab and recorded on Practical copy with flow charts, as applicable.]

1. Write a Python program to accepts two integers and print their sum.
2. Write a Python program that accepts radius of a circle and prints its area.
3. Write a Python program that inputs a student's marks in five subjects (out of 100) and prints the total marks and percentage of marks.
4. Write a Python program to accept length and width of a rectangle and compute its perimeter and area.
5. Write a Python program to compute simple interest for given Principal amount, time and rate of interest.
6. Write a Python program to find whether a given number is even or odd?
7. Write a Python program to find largest among three numbers.
8. Write a Python program to print roots of a quadratic equation $ax^2 + bx + c = 0$ (where $a \neq 0$).
9. Write a Python program to perform arithmetic calculation. This program accepts two operands and an operator then displays the calculated result.
10. Write a Python program to check whether a given year is leap year or not.
11. Write a Python program to print table of a given number.
12. Write a Python Program to print first n Natural numbers and their sum.
13. Write a Python Program to accept two integers X and N, compute X^N
14. Write a Python Program to calculate factorial of given number using while loop.
15. Write a program to print Fibonacci series. i.e. 0 1 1 2 3 5 8 ...
16. Write a Python program to check whether a given number is equal to the sum of the cubes of its digits.
17. Write a program to print following pattern on screen.

```
      *
     ***
    *****
   *********
```
18. Program to add the odd numbers up to (and including) a given value N and print the result.
19. Compute the greatest common divisor and the least common multiple of two integers.
20. Write a Python program to generate prime numbers for given range.
21. Write a Python Program to read a sentence and count number of alphabets, digits, spaces and other characters.
22. Write a Python Program to check whether the given string is palindrome or not.
23. Write a Python program to input numbers and create two tuples containing even and odd numbers.
24. Write a Python Program to input some numbers in a tuples and create second tuple which contain only unique values (non-repeating) values from the first tuple.
25. Write a Python program to create a tuple storing prime numbers in given range.
26. Write a Python program to calculate mean of a given list of numbers.
27. Write a Python program to count the frequency of a given number in a list.
28. Write a Python program to create Phone Directory (mobile number and name) using dictionary and search and display name for given mobile number.
29. Write a Python program to sort a list of 10 numbers using Bubble Sort method.

30. Write a Python program to sort a list of 10 numbers using Insertion Sort method.

SQL Commands (At least 15 SQL queries related to create, insert, delete, select, and join operation etc. should be covered during the lab activities: