

COMPUTER SCIENCE
CLASS-XI (Reduced Syllabus)

1. Prerequisites

No major prerequisites are required for this course other than basic Mathematical skills

2. Learning Outcomes

- Develop a basic understanding of computer systems – architecture.
- Ability to create a simple website
- Ability to embed images, audio and video in an HTML page
- Ability to use style sheets to beautify the web pages.
- Ability to Interface a web site with a web server and record the details of a user's request.
- Develop basic computational thinking. Learn how to reason with variables, state transitions, conditionals, and iteration with python
- Understand the notion of data types, and higher order data structures such as lists, tuples, and dictionaries

3.

Unit No	Unit Name	Marks
Unit -1	Computer Systems and Organization (CSO)	20
Unit-2	HTML	20
Unit-3	Programming and Computational Thinking (PCT-1)	30
Unit - 4	Practical [HTML]	15
Unit - 5	Practical[Python]	15
Total		100

4.1. Unit-1: Computer Systems and Organization (CSO)

- Boolean logic: OR, AND, NAND, NOR, XOR, NOT, truth tables, De Morgan's laws
- Information representation: numbers in base 2, 8, 16, unsigned integers, binary addition

- 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

4.2. Unit 2: HTML

- Introduction to web page designing using HTML: create and save an HTML document, access a web page using a web browser.
- HTML tags: `html`, `head`, `title`, `body`, (attributes: `text`, `background`, `bgcolor`, `link`, `vlink`, `alink`), `br` (*break*), `hr` (*horizontal rule*), *inserting comments*, `h1..h6` (*heading*), `p` (*paragraph*), `b` (*bold*), `i` (*italics*), `u` (*underline*), `ul` (*unordered list*), `ol` (*ordered list*), and `li` (*list item*). *Description lists: dl, dt and dd. Attributes of ol (start, type), ul (type).*
- Font tags (attributes: `face`, `size`, `color`).
- Insert images: `img` (attributes: `src`, `width`, `height`, `alt`), `sup` (*super script*), `sub` (*subscript*).
- HTML Forms: Textbox, radio buttons, checkbox, password, list, combobox.
- Embed audio and video in a HTML page.
- Create a table using the tags: `table`, `tr`, `th`, `td`, `rowspan`, `colspan`
- Links: significance of linking, anchor element (attributes: `href`, `mailto`), `targets`.

4.3. Unit 3: Programming and Computational Thinking (PCT-1)

- 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, and 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.
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- 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.

- Strings: compare, concat, substring; notion of states and transitions using state transition diagrams

5.1. Unit-4: HTML Lab

- Create static web pages.
- Use style sheets to enforce a format in an HTML page (CSS).
- Embed pictures, audio and videos in an HTML page.
- Add tables and frames in an HTML page.
- Decorate web pages using graphical elements.
- Work with HTML forms: text box, radio buttons, checkbox, password, list, combo box.

5.2. Unit-5: 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 number.

Reference Books:-

- 1. Computer Science with Python (class xi) by Sumita Arora , Dhanpat Rai Publication
- 2. Textbook of Computer Science with Python for Class- XI (Two Colours) 1st Edition 2020 by Bhasin, Harsh , New Age International (P) Ltd Publishers
- 3. Progress in Computer Science with Python (class xi) by Sumita Arora , Dhanpat Rai Publication