

2235-Adm
18-12-21

6452-sec
18-12-21

Curriculum for

P. S. TO CHAIRMAN

Diary No. 5053

Date 17-12-21

COMPUTER SCIENCE & IT

Grades IX-X

2018

Copy 17/12/21
Sec.

B in
18/12/21



Acadmic

Rahim
18/12/21

Mr. Noorman

PUNJAB CURRICULUM AND TEXTBOOK BOARD, LAHORE

~~~~~

~~~~~

Contents

INTRODUCTION

STANDARDS AND BENCHMARKS

CURRICULUM FOR COMPUTER EDUCATION - GRADE IX

UNIT 1: PROBLEM SOLVING

UNIT 2: Binary System

UNIT 3: Computer Networking

UNIT 4: Data and Privacy

UNIT 5: Designing Website

THE INTERNET, WWW AND E-MAIL

CURRICULUM FOR COMPUTER EDUCATION - GRADE X

UNIT 1: Introduction to programming

UNIT 2: User Interaction

UNIT 3: Conditional Logic

UNIT 4: Data and Repetition

UNIT 5: Functions

IMPLEMENTATION

- Assessment and Evaluation
- The Distribution of Time -Theory and Lab
- The Textbook
- The Teacher's Manual
- The Workbook
- The Web based Resources

Introduction

In the era of pervasive computing the world is moving on beyond boxy computers that sit on desks or even on laps. Information technology has opened new avenues that enable unprecedented access to vast bodies of knowledge and possibilities of collaboration among researchers and scientists. In order to safeguard the entitlement in this important sphere our children need to be exposed to information and communication technology at an early stage.

The Punjab Curriculum of Computer Education for grade level VI-VIII has been developed in response to the pressing need to provide academic coherence to the rapid growth of computing and technology in

the modern world. According to new scheme of studies the curriculum allots four (4) periods per week and is compulsory for the said grade level. The intent of the curriculum is to prepare students achieve the following goals.

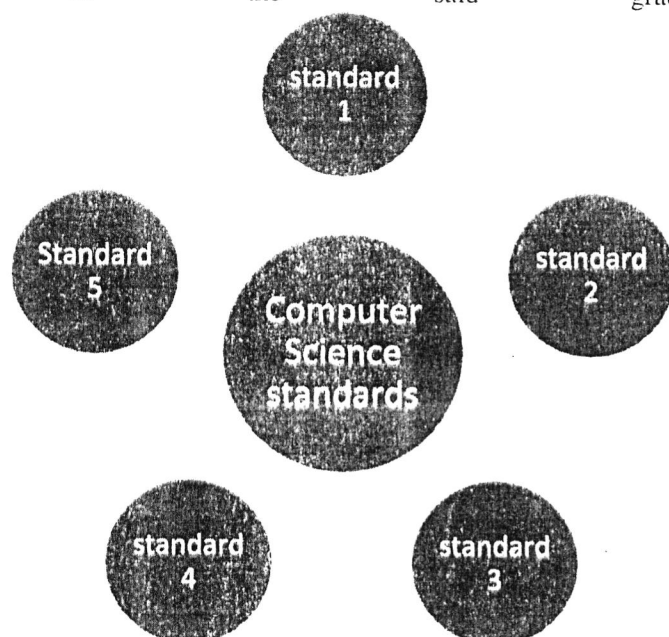
- o Algorithmic thinking and problem-solving
- o Computer and information literacy
- o Productivity through technology

The design of the curriculum combines theory and practice into a learning experience. It will provide the students with the first building blocks of computer and information literacy. They will learn to use computers effectively and incorporate the idea of algorithmic thinking into their daily problem-solving vocabulary. The students will be able to acquire information from electronic resources in a variety of formats.

Standards and Benchmarks

Computer Science curriculum was revised in 2017, following standards are considered to be catered in class 6 to 10 with a gradual progression of skills and knowledge.

Punjab Curriculum for Computer Education is comprised of three standards which serve to define the skills and knowledge to be acquired by every student of grade level VI-VIII. The benchmarks, thereafter, serve as a guide indicating how competencies are to be attained in order to meet the standards. They provide indicators of expectations from students at completion of the said grade level.



COMPUTER AND INFORMATION LITERACY

Upon completion of grade eight, all students will:

- Know how computers work.
- Be comfortable using keyboards and other input and output devices.
- Have the knowledge and ability to use computers and technology efficiently.
- Have ability to access Internet in order to exchange and retrieve information.
- Identify ways to safeguard against computer threats and viruses.
-

BENCHMARKS

The students are expected to:

- 1-1. Recognize hardware components.
- 1-2. Use proper terminology appropriate to the task.
- 1-3. Use a variety of peripherals appropriate to the task.
- 1-4. Use proper keyboarding techniques to reach an appropriate level of proficiency.
- 1-5. Use Windows operating system.
- 1-6. Select and deploy appropriate software for a defined task.
- 1-7. Communicate information in different formats.

1-8. Use internet and e-mail.

1-9. Discuss common uses of technology in daily life.

PRODUCTIVITY THROUGH TECHNOLOGY

Upon completion of grade eight, all students will:

- Have the knowledge and ability to use productivity tools appropriate to the task.

BENCHMARKS

The students are expected to:

- 2-1. Use productivity tools (like Paint, Word, PowerPoint, Excel and E-mail) which help to enhance learning, to increase productivity and to promote creativity.
- 2-2. Design and create interdisciplinary multimedia presentation.

ALGORITHMIC THINKING & PROBLEM-SOLVING

Upon completion of grade eight, all students will:

- Develop understanding of algorithm.
- Begin thinking algorithmically to develop strategy for the problem-solving.

BENCHMARKS

The students are expected to:

- 3-1. Think algorithmically and logically.
- 3-2. Identify the assumptions and known information in a problem statement.
- 3-3. Express the problem in a correct sequential order.
- 3-4. Draw flowcharts using appropriate symbols.
- 3-5. Write programs in BASIC to solve simple daily-life problems.
- 3-6. Create and edit spreadsheets using formulas.



SLOs of Computer Science for Grade-IX

Content: Unit# 1 Problem Solving	Student Learning outcomes
1.1 Understanding the Problem	Students will be able to: 1. Define the problem 2. Analyze the problem 3. Plan the solution of problem 4. Define candid solutions of problem 5. Select the best solution on the basis of least No. of steps
1.2 Algorithm	1. Define an algorithm 2. Explain role of algorithm in problem solving 3. Describe the criteria for measuring efficiency of an algorithm on basis: • Inputs needed • Processing to be completed • Decision to be taken • Outputs to be provided 4. Write algorithms for solving the following problems: • To find the sum, product and average of five given numbers. • To display the larger one out of the three given unequal numbers • To find acceleration of a moving object with given mass and the force applied • To find the volume of a cube, cylinder or sphere • To find the area of a triangle, parallelogram, rhombus or trapezium • To assign grade to a subject based on the achieved marks • To find the interest on an amount • To calculate the exponent of a given number • To find a sequence of odd numbers starting from a given number • To count multiples of a given number lying between two numbers • To produce a multiplication table for a given number • To convert Celsius to Fahrenheit

	temperature and vice versa - Find even numbers in integers ranging from n_1 to n_2 (where n_1 is greater than n_2) - Add members of two lists - Calculate GCD of given two numbers - Determine whether a given number is prime number or not - Determine prime numbers in integers ranging from n_1 to n_2 (where n_1 is greater than n_2)
1.3 Flow Charts	- Define a flow chart - Explain importance of a flow chart for solving a Problem - Determine the following requirements from the given problem or algorithm - Inputs needed - Processing to be completed - Decision to be taken - Outputs to be provided - Use of flow chart symbols - Draw flow charts of algorithms discussed earlier in unit-1 (1.2 (iv))
1.4 Test data	- What is test data - Why testing is needed - Types of test cases
1.5 Validation and verification	- Differentiate between Validation and verification - Methods of verification
1.6 Identify and correction errors	- Draw trace table - Use negative test data to identify all possible type of errors and find solution for errors.
Content: Unit# 2 Binary System	Students Learning Outcomes Students will be able to:

2.1 Introduction of number systems	1. Describe following number systems with Examples • Binary • Decimal • Hexadecimal
2.2 Number System Conversion	1. Convert binary to decimal and decimal to binary number system 2. Convert binary to hexadecimal and hexadecimal to binary number system
2.3 Memory and data storage	1. What is memory 2. Understand how data is represented in a computer memory(with reference of bits and bytes) 3. Storage device 4. Difference between memory and storage devices
2.4 Measurement of size of computer memory.	1. Define following Terms • Bit • Byte • Kilobyte • Megabyte • Gigabyte • Terabyte • Petabyte
2.5 Boolean algebra	1. Explain • A Boolean proposition • Truth values • logical operators(AND, OR ,NOT) • Truth tables • Laws of Boolean algebra ➤ Closure ➤ Commutative ➤ Associative ➤ Distributive ➤ Identity

	➤ Complement • Logical expressions
Unit # 3 Computer Networking Content: Networks 3.1 Networks 3.2 Basics of Communication 3.3 The Need for Addressing 3.4 Routing	Students Learning Outcomes Students will be able to: 1. Define Computer Network 2. Describe why network needed 3. Define Client and Server 1. Explain the following components of a communication system • Sender • Receiver • Message • Protocol • Transmission Medium 1. Explain why messages need to contain addressing information (sender/recipient identification) 2. Understand the importance of addressing in telephone addressing and postal service. 3. Recall that browsing the Internet entails computers sending each other requests and sending back data to satisfy those requests. 4. Understand IP addressing 1. Understand router and its following functions • Identify source and destination • Receiving message from source • Sending message to destination
Unit # 4 Data and Privacy Content: 4.1 Ethical issues related to security	Students Learning Outcomes Students will be able to: 1. Understand ethical issues related to data security 2. Understand that it is their responsibility to safeguard the privacy of others.

4.2 Importance of data privacy	1. Explain privacy concerns that arise through the mass collection of data 2. Analyze the personal privacy and security concerns that arise with any use of computational systems.
4.3 Simple Encryption	1. Explain why encryption is an important need for everyday life on the Internet. 2. Crack a message encrypted with a Caesar cipher using a Caesar Cipher Widget 3. Crack a message encrypted with random substitution using Frequency Analysis 4. Explain the weaknesses and security flaws of substitution ciphers
4.4 Encryption with Keys and Passwords	1. Explain the relationship between cryptographic keys and passwords. 2. Explain in broad terms what makes a key difficult to "crack." 3. Reason about strong vs. weak passwords using a tool that shows password strength. 4. Characteristics of good password 5.
4.5 Cyber crime	1. Explain the characteristics of a phishing attack 2. Explain how a DoS(denial of service) attack
Unit#5 Designing Website Content: 5.1 Introduction to HTML	Students Learning Outcomes Students will be able to: 1. Define Hypertext Markup Language (HTML) 2. Explain the steps involved to: • Create and save an HTML file • Display a webpage 3. Identify the tags used to mark-up HTML elements 4. Identify the following elements: • HTML • Head section • Body section
5.2 Text Formatting	1. Describe the steps involved to: • Specify a page title • Create a paragraph • Insert line breaks • Insert spaces • Add headings/sub-headings

	- Identify the text formatting tags used to format the text in various font styles, colors and sizes - Use appropriate text formatting tags to define: - Font size - Font color - Font face - Bold text - Italic text - Underline text
5.3 Creating Lists	- Differentiate among unordered list, ordered list, definition list and nested list - Create: - Unordered list - Ordered list - Definition list - Nested list
5.4 Images and Backgrounds	- Add: - An image - Border to the image - Specify: - Width of the image - Height of the image - An alternate text for the image - Apply: - Background color to a webpage - Foreground color to a webpage - Assign a background image to the webpage
5.5 Hyperlinks	- Define a hyperlink - Create a hyperlink to a webpage - Define an anchor - Create an anchor to hyperlink within a webpage - Create a graphical hyperlink
5.6 Creating Tables	- Create a table in the webpage - Apply the following table attributes: - Border - Colspan - Rowspan

SLOs of Computer Science for Grade-X

Unit# 1 Introduction to programming	Students Learning Outcomes
Content: 1.1 Programming Environment 1.2 Programming Basics 1.3 Constants and Variables	Students will be able to: - Describe the concept of Integrated Development Environments (IDE) - Explain the following modules of the C programming environment - Editor - Compiler - Identify the reserved words - Describe the structure of a C program covering include - main () function - Body of main { } - Explain the purpose of comments and their syntax - Explain the difference between a constant and a variable - Explain the rules for specifying variable names - Know the following data types offered by C and the number of bytes taken by each data type - Integer -- int (signed/unsigned) - Floating point -- float - Character -- char - String -- string - Boolean- bool - Explain the process of declaring and initializing variables
Unit# 2 User Interaction	Students Learning Outcomes
Content: 2.1 Input/ Output functions	Students will be able to: - Use output functions like printf () - Use input functions like: - scanf ()

2.2 Operators

- getch ()
 - 3. Use statement terminator (semicolon)
 - 4. Define Format specifiers
 - decimal - %d
 - integer - %i
 - float - %f
 - char - %c
 - 5. Define an escape sequence
 - 6. Explain the use of the following escape sequences using programming examples:
 - Newline -- \n
 - Tab -- \t
-
1. Define an arithmetic operator.
 2. Use the following arithmetic operators:
 - Addition (+)
 - Subtraction (-)
 - Multiplication (*)
 - Division (/)
 - Remainder (%)
 3. Use the assignment operator
 4. Define relational operators.
 5. Use the following relational operators:
 - Less than (<)
 - Greater than (>)
 - Less than or equal to (<=)
 - Greater than or equal to (>=)
 - Equal to (==)
 - Not equal to (!=)
 6. Define a logical operator.
 7. Use of the following logical operators:
 - AND (&&)
 - OR (||)
 - NOT (!)
 8. Differentiate between the assignment operator (=) and equal to operator (==).
 9. Differentiate between the unary and binary operators
 10. Define and explain the order of precedence of operators

Unit# 3 Conditional Logic Content: 3.1 Conditional Statements	Students Learning Outcomes Students will be able to: 1. Define a control statement. 2. Define a conditional statement 3. Know the structure of if statement: 4. Use if statement 5. Know the structure of if-else statement 6. Use if-else statement 7. Use nested selection structures 8. Write codes for flowcharts discussed in unit-1
Unit# 4 Data and Repetition Content: 4.1 Data structures 4.2 Loop Structure	Students Learning Outcomes Students will be able to: 1. Understand the structure of array 2. Declaration and use of one dimensional array 3. Use variable as an index in array 4. Read and Write values in array 1. Explain the concept of loop structure 2. Know that for loop structure is composed of: • For • Initialization expression • Test expression • Body of the loop • Increment / decrement expression 3. Explain the concept of a nested loop 4. Write codes for flowcharts discussed in unit-1 5. Use loops to read and write data in array
Unit# 5 Functions Content: 5.1 Functions	Student Learning Outcomes Students will be able to: 1. Explain the concept and types of function 2. Explain the advantages of using functions 3. Explain the signature of function (Name, Arguments, Return type)

4. Explain the following terms related to functions

- Define a function
- Using of a function

5. Write following functions using C language:

- A function which take two integer variables as an argument and return the sum of these variables.
- A function which take three variable and returns median of given number.

9th exercises(Suggested Practicals)

1. Draw a flowchart that calculates the sum and product of two number.
2. Draw a flowchart that calculates the difference and division of two numbers.

3. Draw a flowchart that calculates the modulus of an integer with respect to another integer.
4. Draw a flowchart that calculates the sum and average of three numbers.
5. Draw a flowchart that calculates the cube of a number.
6. Draw a flowchart that calculates the area of a rectangle
7. Draw a flowchart that calculates the area of a triangle when three sides are given.
8. Draw a flowchart that calculates the area and circumference of a circle.
9. Draw a flowchart that calculates the area and perimeter of a square when one side is given
10. Draw a flowchart that calculates the volume of a cylinder
11. Draw a flowchart that calculates the surface area and volume of a cube.
12. Draw a flowchart that converts the temperature from centigrade to Fahrenheit
13. Draw a flowchart that converts the temperature from Fahrenheit to centigrade
14. Write a program to print the distance covered by a car having an average speed.
15. Draw a flowchart that takes a number as input and displays whether it is even or odd.
16. Draw a flowchart that takes three numbers as input and displays the largest among them.
17. Draw a flowchart that takes a number as input and prints an error message if the number is not 1 or 2.
18. Draw a flowchart that takes three integers as input and displays the largest two.
19. Draw a flowchart that prints the grade of a student.
20. Draw a flowchart that prints first 10 integers using loop.
21. Draw a flowchart that prints even numbers from 1 to 10
22. Draw a flowchart that prints odd numbers from 1 to 10
23. Draw a flowchart that takes a number as an input and prints its multiplication table up to 10.
24. Draw a flowchart that takes a number as an input from the user and prints its factorial
25. Draw a flowchart that takes two numbers as input and prints the multiplication table of the first number up to the second number.
26. Draw a flowchart that prints integers from 10 to 1 (reverse order, using loop).
27. Draw a flowchart that takes input "n" from the user and prints the sum of first "n" numbers and their average.
28. Draw a flowchart that takes a number "n" as input from the user and prints the first "n"

numbers of Fibonacci series.

29. Draw a flowchart that takes a number "n" as input from the user and prints triangle of stars, having rows equal to "n".
30. Draw a flowchart that takes few numbers as input from the user and prints them in reverse order.
31. Draw a flowchart that takes few numbers as input from the user and prints the minimum and maximum among them.
32. Draw a flowchart that takes 10 numbers as input from the user and print all the odd ones.
33. Draw a flowchart that takes a number as input and prints its binary representation.
34. Draw a flowchart that takes input from the user and converts it into its ASCII.
35. Draw a flowchart that takes two numbers "m" and "n" as input from the user and calculates "m" to the power of "n".
36. Draw a flowchart that takes two numbers as input calculates the GCD of the numbers using Euclidean algorithm.
37. Draw a flowchart that takes a 5 digit integer as input and reverses its presentation. For example, "54321" will becomes "12345".
38. Draw a system of flowcharts that take inputs from the user and perform the basic arithmetic operations on them using a modular approach. (A simple calculator).
39. Draw a flowchart that can take maximum 20 characters from the user and returns whether the input is a palindrome or not.
40. Draw a flowchart that takes an integer as input from the user and prints whether the integer is prime or not.
41. Creating an HTML page which has following tags
 - html
 - body
42. Create an HTML page which has following additional tags
 - title
 - paragraph
 - line break
43. Create an HTML page which has following additional functions
 - Headings up to three levels
 - Bold, italic, underline
44. Create an HTML page which has following additional functions
 - font size
 - font face
 - font color
- 45- Create an HTML page which has following additional functions
 - having and image

- alternate text
- adjust the height, width and border of the image
- 46- Create an HTML page which has following additional functions
 - Background/foreground colors
 - background image
- 47- Create an HTML page which has following additional functions
 - un-ordered list
 - ordered list
- 48- Create an HTML page which has following additional functions
 - nested list
 - definition list
- 49- Create an HTML page which has multiple sections and a table of contents. The table of contents has anchors to different sections.
- 50- Create a website with two web pages linked to each other. The links are in text.
- 51- Create a website with three interlinked web pages. At least one of the links must be an image.
- 52- Create an HTML page which has a table with some specified number of rows and columns.
- 53- Create an HTML page which has a table with some specified number of rows and columns, but some of the cells are merged together using colspan and rowspan.
- 54- Create an HTML page which has a table, and the border of the table is of a specified width and border type.
- 55- Create a website which has multiple pages and all the components mentioned above.

10th (Suggested Practicals)

1. Get familiar with Visual Studio Community Edition C/C++, and using proper file extension of your code file.
2. Write a program which uses all types of variables and print their output.
3. Write a program to print formatted output using escape sequences.
4. Write a program to print the sum and product of two integers and floats.
5. Write a program to print the difference and division of two floats.
6. Write a program to print the use modulus operator on integers.
7. Write a program to print the sum and average of three floats.
8. Write a program to print the cube of a number (float)
9. Write a program to print the area of a rectangle
10. Write a program to print the area of a triangle when three sides are given.
11. Write a program to print the area and circumference of a circle.
12. Write a program to print the area and perimeter of a square when one side is given
13. Write a program to print the volume of a cylinder
14. Write a program to print the surface area and volume of a cube.

15. Write a program to convert the temperature from centigrade to Fahrenheit
16. Write a program to convert the temperature from Fahrenheit to centigrade
17. Write a program to print the distance covered by a car having an average speed.
18. Write a program which asks the name, roll number, class, section and marks in different subjects of a student of class 10. The program should calculate and display total obtained marks and percentage of the student.
19. Write a program that takes a number as input and displays whether it is even or odd.
20. Write a program that takes three numbers as input and displays the largest among them.
21. Write a program that takes a number as input and prints an error message if the number is not 1 or 2.
22. Write a program that takes three integers as input and displays the largest two.
23. Write a program that prints the grade of a student.
24. Write a program that prints first 10 integers using for loop.
25. Write a program that prints even numbers from 1 to 10
26. Write a program that prints odd numbers from 1 to 10
27. Write a program that takes a number as an input and prints its multiplication table up to 10.
28. Write a program that takes a number as an input from the user and prints its factorial
29. Write a program that takes two numbers as input and prints the multiplication table of the first number up to the second number.
30. Write a program that prints integers from 10 to 1 (reverse order, using loop).
31. Write a program that takes input "n" from the user and prints the sum of first "n" numbers and their average.
32. Write a program that takes a number "n" as input from the user and prints the first "n" numbers of Fibonacci series.
33. Write a program that takes a number "n" as input from the user and prints triangle of stars, having rows equal to "n".
34. Write a program that creates an array and initializes it with first 10 integers and displays them on screen, using loop.
35. Write a program that takes few numbers as input from the user and prints them in reverse order.
36. Write a program that takes few numbers as input from the user and prints the minimum and maximum among them.
37. Write a program that takes 10 numbers as input from the user and print all the odd ones.

38. Write a program that takes a number as input and prints its binary representation.
39. Write a program that takes input from the user. The program passes the input to a function which converts it into its ASCII and returns it back to the main function. The main function prints the ASCII of the number.
40. Write a program that can take maximum 20 characters from the user. The program saves these characters in an array and prints them on the screen as the user is typing. (use getch() and printf() with loop and array)
41. Write a program that can take maximum 20 characters from the user as his password. The program does not print them on the screen when the user is typing. The program then encrypts the password using Caesar cipher and prints it on the screen. (Pressing enter will terminate the input)
42. Write a program takes two numbers as input from the user and then passes them to a function named sum. The function returns the sum of the numbers and the main function prints the output.
43. Write a program that takes two numbers "m" and "n" as input from the user, then passes them to a function. The function calculates "m" to the power of "n" and returns the value to the main function. The main function prints the value on screen.
44. Write a program that takes few numbers as input from the user, then stores them in an array and passes that array to a function. The function sorts that array. The main function prints the sorted array in ascending order.
45. Write a program that takes two numbers as input and passes them to a function. The function calculates the GCD of the numbers using Euclidean algorithm, and returns to the main function. The main function prints the GCD.
46. Write a program that takes a 5 digit integer using scanf() as input from the user and reverses its presentation. For example, "54321" will becomes "12345".
47. Write a program that takes inputs from the user and performs the basic arithmetic operations on them using a modular approach. (A simple calculator).
48. Write a program that takes hourly rate and the number of hours of 10 different employees, from the user. The program then calculates the salary of each employee and prints them on screen (use modular approach).
49. Write a program that can take maximum 20 characters from the user and returns whether the input is a palindrome or not.
50. Write a program that takes an integer as input from the user and prints whether the integer is prime or not.

Implementation

•Assessment and Evaluation

Assessment is the process of gathering information using a variety of tools and techniques that reflect how well a student is achieving the curriculum expectations in a subject. As part of assessment teachers provide students with descriptive feedback that guides their efforts towards improvement. The quality of assessment largely determines the quality of evaluation. Evaluation refers to the process of judgments and decisions based on the interpretation of evidence gathered through assessment. Rowntree' (1990) defined assessment as having two purposes: firstly to support and provide feedback to learners and improve their ongoing learning, and secondly to report on what they had already achieved. In essence the first is formative assessment and the second is summative assessment. Morgan and O'Reilly' (1999) believe that assessment is the engine that drives and shapes learning, rather than an end of course event that grades and reports on performance.

Assessment and evaluation should be based on the expectations outlined in the national curriculum. To ensure that assessment and evaluation lead to the improvement of student learning, teachers must use specific assessment and evaluation strategies that

- address both what students learn and how well they learn.
- are administered over a period of time and designed to provide opportunities for students to demonstrate full range of their learning.
- ensure that each student is given clear directions for improvement.
- promote students' ability to assess their own learning.
- are communicated clearly to students and parents in advance.

For assessment and evaluation of grade level VI-VIII the institutions adopt their own criteria. The means by which each institution achieves quality should differ according to the circumstances in which it operates, but each must give priority to meeting students' expectations in terms of learning outcomes they can legitimately expect to achieve. In essence an effective learning-outcomes-oriented quality assurance system must be based on constant monitoring and effective feedback loops.

'Rowntree, D. (1990) *Teaching through Self-Instruction (Second Ed)*. London: Kogan Page.

Morgan, C. and O'Reilly, M. (1999) *Assessing Open and Distance Learners*, London: Kogan Page.

Unit wise Weightages

Following tables explain weightages of specified topics with respect to grades IX-X. They will be supportive to:

- the teachers and education planners to develop the assessment and evaluation strategies,
- the textbook writers to give a specific weightage to a particular topic.

UNITWISE WEIGHTAGES -GRADE IX

Unit	Title	Weightage	No. of Periods	
			Theory	Lab
1.	Problem Solving	20 %	20%	0%
2.	Binary System	20 %	15%	5%
3.	Computer Network	20 %	10%	10%
4.	Data and Privacy	20 %	10%	10%
5.	Designing Websites	20 %	5%	15%
TOTAL		100 %	60%	40%

UNITWISE WEIGHTAGE FOR GRADE X

UNIT	TITLE	WEIGHTAGE	NO. OF PERIODS	
			Theory	Lab
1	Introduction to programming	10%	5%	5%
2	User interactions	20%	5%	15%
3	Conditional logic	20%	10%	10%
4	Data repetition	25%	10%	15%
5	Functions	25%	10%	15%
		100	40%	60%

The Textbook

There are many important entities involved to revamp the entire education system. The

school has to play its own role, parents have to contribute their share and teachers have to assume a significant place in fostering education. Print materials, particularly the textbooks, have to play a key role towards providing quality education at all levels. Although there are many stakeholders that contribute towards the overall learning of the child yet the importance of textbook as a reservoir of information/ knowledge cannot be ignored.

Textbook writers have a vital role to play in penetrating the young minds through their writing. A textbook

- whose content as well as presentation is thoughtfully planned,
- which is written by qualified and competent subject expert(s), and
- which is attractive and engaging,

must stimulate the interest of teacher and the taught.

Guidelines for Textbook Authors

Textbooks aimed at lower level tend to include more learning features than those at higher level. However in textbook writing generally the following aspects may be taken into consideration.

- The textbook should be in line with the objectives of National Curriculum.
- The author should continuously focus on standards and benchmarks.
- The textbook should be visually appealing and should maintain interest of the students.
- The title page should be attractive and representative of the content of the textbook.
- The colour scheme of pictures should be close to real life.
- The textbook should include detailed table of contents.
- The text should be clear and concise.
- The material should not be cramped. To make it more digestible, it may be chunked into smaller parts with headings.
- The author should bring himself to the mental level of students he is writing for.
- The span of the textbook should be fairly reasonable.
- The textbook is expected to provide accurate and up-to-date information.
- The text material should be arranged in a logical manner; simple to complex, familiar to unfamiliar and concrete to abstract.
- The text material must be free from ambiguities and errors.

Textbook Style and Structure

To make a textbook an effective teaching and learning tool its style and structure is given due importance. The material needs to be structured in a coherent and logical way, and that writing style should be reader friendly.

Unit Outline	Include list of headings.
Student Learning Outcomes (SLOs)	One SLO for each heading may be included. If they are numerous then a reasonable number is acceptable.
Short Introduction	Explain what this unit covers and why.

Unit Body	
Key Terms	Use italics for emphasis and bold for key terms. Define key terms when first introduced and collate them with their definitions for the glossary.
Tips or Hints	Separated from the main body of text, they allow the author to speak directly to the student, offering useful advice or flagging important points.
Visuals	Include pictures that illustrate the use and importance of computer and technology.

Unit Ending	
Checkpoint Exercises	Include multiple-choice questions, interpretive exercises, fill-in and matching items. Students may also be asked to label diagrams or write a one word answer to short question.
Lab Exercises	Include computer lab exercises, appropriate to the unit.
Summary	Include a review of the main concepts. This can relate to the SLOs by covering each in turn (bullet points work well). The summary should not include any new information.

End of Textbook	
Glossary	Include only the key terms in the glossary.
Bibliography	Include bibliography and list of books for suggested reading.
Index	Include index for the key terms used in the book.

The Teacher's Manual

Ideally the teacher's manual should come with the textbook. The manual is aimed at informing teachers how the textbook is written and how best to use it to facilitate student

learning. It can be seen as a means of helping teachers develop professionally. It provides detailed explanation of key concepts and the way to teach a particular topic. Its basic features are as below.

The teacher's manual should

- be easy to understand and use.
- help teachers teach text and extend activities.
- give sequenced instructions for each activity.
- include detailed lesson plans.
- suggest projects to assign.
- include teaching learning resources.
- establish a test bank (having questions different from text) and suggest interactive quizzes corresponding to each unit.
- involve various up-to-date and relevant teaching strategies and rationale for suggested teaching.
- explain how to implement each teaching strategy.
- identify constraints and strengths of each strategy or activity.
- identify resources needed for teaching strategies and extension of activities.
- expand and develop teachers repertoire of knowledge and skills.
- identify assessment strategies.

The Workbook

Workbooks contain writing activities and exercises that are related to each unit in the textbook. Workbook exercises help to develop students' conceptual understanding of the topics dealt with in the text. They assist students in developing skills by applying knowledge to new situations. A workbook has the following basic features.

A workbook should

- be easy for students to understand and follow.
- involve clear and explicit instructions.
- be stimulating, challenging and innovative.
- correspond to knowledge and skill developed in the textbook.
- consist of many exercises and activities for each unit, topic and subtopic.
- be non-repetitive in style and structure.
- avoid using too many activities for one topic or skill.
- include exercises and activities which are different from those in textbook or teacher's manual.
- suggest accessible and affordable materials/resources for the proposed activities.

The Web-based Resources

The World Wide Web is growing very fast to access an immense volume of rapidly evolving information. It is acting as a driving force since its ease of use makes the internet trivially

accessible. Through web-based links like the ones mentioned below the teachers, parents and students can

- access various sites around the world,
- access additional information and currency on the topics,
- view three-dimensional figures, graphics, lesson plans, activities and various books of interest.

Title of Website	Universal Resource Locator (URL)
About.com	www.about.com
Coloring.com	www.coloring.com
Computer Knowledge	www.cknow.com/vtutor/index.html
Excel Tutorial	www.usd.edu/triu/tut/excel
Funbrain	www.funbrain.com
Google	www.google.com
Hotmail	www.hotmail.com
HowStuffWorks	www.howstuffworks.com
Internet4Classrooms	www.internet4classrooms.com/on-line_word.htm
Learn the Net	www.learnthenet.com/english/index.html
PowerPoint in the classroom	www.actden.com/pp
Robot Magazine	www.botmag.com
TypingMaster	www.typingmaster.com
TypingTutor	www.typingtutor.com
Yahoo!	www.yahoo.com
Yahoo Mail	www.mail.yahoo.com
Wikipedia	en.wikipedia.org