

# Maharashtra State Board of Vocational Examination, Mumbai 400 051

1	Name of Course	Diploma Course in Computer Programming									
2	Course code	101404									
3	Max no. of Students	25 Students									
4	Duration	2 year									
5	Course Type	Full Time									
6	No. of Days per week	6 days									
7	No. of hours per day	7 Hrs									
8	Space require	Theory Class Room – 200 sqft Three Practical Lab – 500 sqft each									
9	Entry qualification	S.S.C. Pass									
10	Objective of syllabus	To get Knowledge of Computer fundamentals, To Understanding the Software Programming concept, To aquire the software skills, To understand and learn the software development skills									
11	Employment opportunities	To work as a Computer Operator is the offices/Schools, Programming assistant for the software consultant/industry, Assistant to Software designer/developer									
12	Teachers Qualification	1) For Vocational Subject : B.E.Computer Science/B.E. Computer Engg./ B.E. Computer Technology 2) For Non Vocational Subject : Master Degree in Concern Subject.									
13	Teaching Scheme –										
	Sr.	Subject	Subject Code	Clock Hours / Week				Total			
				Theory	Practical						
	1	English (Communication Skill)	90000001	2 Hrs	1 Hrs					3 Hrs	
	2	Elective – I	--	2 Hrs	1 Hrs					3 Hrs	
	3	Elective – II	--	2 Hrs	1 Hrs					3 Hrs	
	4	Computer Fundamentals & Applications	10140001	3 Hrs	8 Hrs					11 Hrs	
	5	Computer Programming Elements	10140002	3 Hrs	8 Hrs					11 Hrs	
	6	C & C++ programming	10140008	3 Hrs	8 Hrs					11 Hrs	
	Total									42 Hrs	
14	Internship	Two Month Summer Internship from 1 <sup>st</sup> May to 30 <sup>th</sup> June is Compulsory.									
15	Examination Scheme – Final Examination will be based on syllabus of both years.										
	Paper	Subject	Subject Code	Theory			Practical			Total	
				Duration	Max	Min	Duration	Max	Min	Max	Min
	1	English (Communication Skill)	90000001	3 Hrs	70	25	3 Hrs	30	15	100	40
	2	Elective – I	--	3 Hrs	70	25	3 Hrs	30	15	100	40
	3	Elective – II	--	3 Hrs	70	25	3 Hrs	30	15	100	40
	4	Computer Fundamentals & Applications	10140001	3 Hrs	100	35	3 Hrs	100	50	200	85
	5	Computer Programming Elements	10140002	3 Hrs	100	35	3 Hrs	100	50	200	85
	6	C & C++ programming	10140008	3 Hrs	100	35	3 Hrs	100	50	200	85
	Total									900	375
16	Teachers – Three Teachers per batch for vocational component. For English, Elective-I & II guest faculty on clock hour basis.										
17	a) For Elective I – Student can choose any one subject Code Subject Name 90000011 Applied Mathematics 90000012 Business Economics 90000013 Physical Biology (Botany & Zoology) 90000014 Entrepreneurship 90000015 Psychology b) For Elective II – Student can choose any one subject Code Subject Name 90000021 Applied Sciences (Physics & Chemistry) 90000022 Computer Application 90000023 Business Mathematics										

## Subject Code : 10140001

### Computer Fundamentals & Applications– 1<sup>st</sup> year

Theory	Practical
<b>Detailed Syllabus :</b> <b>1.0. Introduction</b> 1.1. Basic idea about Computer 1.2. Applications of Computer 1.3. History of Computer generation 1.4. Different phases of computer invention (Analytical Engine to Analog Computer and Digital Computer) 1.5. Computer types and their applications 1.6. Comparative table of capabilities as per the type	<b>Detailed Syllabus</b> <b>1.0. Computer basics</b> 1. Identification of Keyboard, Printer, Monitor Scanner, Webcam, Microphone, Speaker
<b>2.0. Computer Architecture &amp; Organization</b> 2.1. Concept of Computer as a System 2.2. The structural block diagram of a computer 2.3. Different blocks of a Computer and their functions 2.4. Different input devices and their uses & limitations 2.5. Different output devices giving their uses & limitations 2.6. Memory: definition, types. 2.7. Primary memory and its classification with applications 2.8. Secondary memory devices 2.9. Classification giving specifications of different secondary storage media	<b>2.0. Practice</b> 1. Sample collection of various type of storage devices, specifications and charts
<b>3.0. Data representation &amp; organization</b> 3.1. Data/ information, file, directory 3.2. Binary number system 3.3. Conversion of binary numbers to decimal numbers 3.4. Conversion of decimal numbers to binary numbers 3.5. Binary arithmetic (Binary addition, subtraction) 3.6. Introduction to different number system (Octal and Hexadecimal) 3.7. Data representation using Binary codes, ASCII codes 3.8. Bit, Byte.....	<b>1. Conversion of binary to decimal</b> <b>2. Conversion of binary to hexadecimal</b> <b>3. Conversion of binary to octal</b>

## Computer fundamentals & Applications– 2<sup>nd</sup> year

Theory	Practical
<b>Detailed Syllabus :</b> <b>1.0. Introduction to Softwares</b> 1.1. Basic idea about Softwares 1.2. Types/ Classification of Softwares 1.3. Functions of System Softwares 1.4. Use of Application Softwares 1.5. Applications of Programming Softwares	<b>Detailed Syllabus</b> <b>1.Study of application software</b> <b>2.Study of System software</b>
<b>4.0. Computer Hardware &amp; Software</b> 4.1. Definition of Hardware & Software 4.2. Functions of hardware devices 4.3. Types Softwares and their applications 4.4. Introduction to Operating system 4.5. Study of MS DOS environment and DOS commands 4.6. Study of MS Windows environment & Windows default icons 4.7. Windows explorer 4.8. Creating files & folders in Windows O.S. 4.9. Introduction to Unix	<b>1. Study of various dos command</b> <b>2. Study of various type of printers</b> <b>3. Study of dos, windows, windows xp.</b> <b>4. Creation of directory, folders, files</b>
<b>2.0. Windows Accessories</b> 2.1. Study of different features of Windows Accessories 2.2. Note Pad 2.3. Paint Brush 2.4. Word Pad	<b>2.0. Practice</b> <b>2.1 Create any document in notepad</b> <b>2.2 Draw different shapes in paint</b>
<b>3.0. Software Installation</b> 3.1. Installation procedure of different Softwares 3.2. Installation of Antivirus Softwares 3.3. Installation of Windows Operating System	<b>1.Installation of antivirus</b> <b>2.Installation of Windows xp</b>
<b>4.0. Installation of Hardware devices</b> 4.1. Installation of Drivers 4.2. Installation of Printer 4.3. Installation of NIC 4.4. Installation of Modem 4.5. Running Setup programs	<b>4.0.</b> <b>1.Installation of printer</b> <b>2. Installation of NIC card</b> <b>3. Installation of Modem</b>

### Reference Books:

1. Computer fundamentals by P K Sinha
2. PC Software For Windows 98 Made Simple by Taxali
3. MS DOS Operating system user manual
4. Windows Operating system user manual

**Subject Code : 10140002**

**Computer Programming Elements – 1<sup>st</sup> year**

<b>Theory</b>	<b>Practical</b>
<b>1.0. Computer Languages</b> 1.1. General Introduction 1.2. Computer Languages 1.2.1. Definition of a Program 1.2.1. Data, Instruction/command 1.2.2. Source codes, Object codes 1.2.3. Machine code languages 1.2.4. Assembly code languages 1.2.5. High level languages 1.3. Interpreter, Compiler	1.0. Study of different interpreter 2.0. Classifying the interpreters and compilers
<b>2.0. Basic Programming</b> 2.1. Algorithm 2.2. Flow charts & Data flow diagrams 2.3. Different DFD symbols 2.4. Use & application of DFD 2.5. Constants, Variables & expressions 2.6. Operators: Arithmetic, Logical, Relational in general 2.7. Application of different operators with examples	1.0. Drawing flow charts for simple programs/problems 2.0. Simple DFDs for various problem solving 3.0. Expression building for different problems
<b>3.0. Introduction to QBasic</b> 3.1. Understand the concept of QBASIC programming 3.2. Getting started with QBASIC 3.3. Input Commands 3.4. Loop commands 3.5 .IF....ELSE...THEN 3.6. Planning a simple program 3.7. Different programs using logical and loop statement	<b>1.0.</b> At least 10 programs using I/O commands 2.0. At least 5 programs using each loop statements. 3.0. At least 5 programs using IF, IF ... Else... THEN statements.

## Computer Programming Elements – 2<sup>nd</sup> year

Theory	Practical
<b>1.0. Data structure</b> 1.1. Data 1.2. Domain 1.3. Data Object 1.4. Data Representation	
2.0 Stack 2.1 push 2.2 pop 2.3 Reverse of string 2.4 LIFO method	Implement operations on stack. Reverse of string using stack.
3.0. Queue 3.1. FIFO method 3.2. Front 3.3. Rear 3.4. Doubly ended queue 3.5. Examples	<b>Implement operations on queue.</b> <b>Insertion &amp; display elements in queue.</b> <b>Deletion &amp; display elements in queue</b>
4.0 Linked list 4.1 single linked list 4.2 Circular linked list 4.3 Doubly linked list 4.4 First ptr, Next ptr, Prev ptr	<b>Display single linked list.</b> <b>Find out middle elements in list.</b> <b>Find out last elements in list.</b>
5.0 Searching 5.1 Linear search 5.2 Binary search	Searching the elements using linear search. Searching the elements using binary search.
6.0 Sorting 6.1 Bubble sort 6.2 Insertion sort 6.3 Selection sort 6.4 Merge sort 6.5 Radix sort 6.6. Quick sort	Sort the elements using bubble sort. Sort the elements using Radix sort. Sort the elements using Insertion sort. Sort the elements using Selection sort. Sort the elements using Merge sort. Sort the elements using Quick sort.

### Text Book:

1. K.R Venugopal 'Mastering C++', Tata Mcgrawhill1997

### References:

1. B.Stroustrup 'C++ Programming Language' (3rd Edition). Addison Wesley, 1997
2. B.chandra Narosa 'A Treatise On Object Oriented programming using C++'-  
Publications, 1998
3. Herbert Schildt, "The Complete Reference CN", Tata McGraw-Hili, 2001.

**Subject Code - 10140008****C & C++ Programming – 1<sup>st</sup> Year**

<b>Theory</b>	<b>Practical</b>
<b>1.0. Introduction</b> 1.1. Introduction to C Programming 1.2. History of C Programming 1.3. Concept of problem solving using C 1.4. Structure of C Program 1.5. Library functions	1. Basic structure diagram of c program
<b>2.0. Problem solving</b> 2.1. Steps in problem solving 2.2. Solving numerical problems 2.3. Concept of Algorithm & Flow charts 2.4. Making flow charts for problem solving 2.5. Merits & demerits in using Flow charts	1. Calculate area of rectangle 2. Write algorithm for addition of two no. 3. Draw flowchart for division of two no. 4. Write algorithm for area of circle.
<b>3.0. Variables &amp; constants</b> 3.1. Introduction to Data and variables 3.2. Declaration of variables, constants 3.3. Operators and their functions	1. Declare & display integer data. 2. Declare & display float data. 3. Declare & display double data. 4. Declare & display char data.
<b>4.0. Input and output</b> 4.1. Formatted input 4.2. Formatted output 4.3. Sample programs	1. Read & .Display user defined data. 2. To display HELLO msg on screen. 3. To display welcome on screen.
<b>5.0. Control structures</b> 5.1. Decision making stmt. (If ,If else,else if ladder) 5.2. Iterative stmt.(for,while,do-while) 5.3. Selection stmt(switch case) 5.4. Break 5.5. Continue 5.6. Jump	1. To check whether no is positive or negative. 2. To check whether no is even or odd. 3. Display 0 to 5 number using for loop 4. Display 10 to 0 number using while loop 5. Menu driven prog for arithmetic operations 6. Greatest no among 3 no. 7. Smallest no among 3 no.
<b>6.0. Functions</b> 6.1. What is function? 6.2. Advantages of function 6.3. Library functions 6.4. User defined functions 6.5. Call by value 6.6. Call by reference 6.7. Recursions	1. Swapping of two no using call by value. 2. Swapping of two no using call by reference 3. Calculate area of circle using function. 4. Calculate factorial of a given number. 6. Calculate product of two no using function. 7. Calculate factorial of a given number using recursion.
<b>7.0. Arrays</b> 7.1. Concept of an array 7.2. Definition & Declaration of an array 7.3. Single dimensional 7.4. Multi dimensional array 7.5. Array & functions	1. Read & display single dimensional array. 2. Read & display multi dimensional array. 3. Addition of matrix. 4. Substraction of matrix

<b>8.0. Pointers</b> 8.1. Introduction and overview of pointers 8.2. Programs using pointers 8.3.Pointer arithmetic 8.4.Memory organization	1.Declare & display data using pointer. 2.Pointer arithmetic 3.Display memory address using pointer
<b>9.0. Strings</b> 9.1. Definition & initialization of string 9.2.String input & output 9.3.Standard library functions	1.Calculate length of string 2.string copy 3.string concat 4.string compare 5.string reverse
<b>10.0. Structure &amp; union</b> 10.1. Definition & declaration of structure. 10.2.Memory structure for structure & union 10.3.Comparison between structure & union	1.Declare structure for book 2.Declare & display structure for employee. 3.Array of structure..
<b>11.0.File handling</b> 11.1.Stream 11.2.Types of file 11.3.Operations on file	1.Command line argument

**Subject Code - 10140008****C & C++ Programming – 2<sup>nd</sup> Year**

<b>Theory</b>	<b>Practical</b>
<b>1.0. principles of object oriented programming</b> 1.1. Introduction to C Programming 1.2. Introduction of object oriented languages. 1.3.Comparision bet pop & oop 1.4.Basic concepts of oop 1.5.Diff bet structure & class	1.Basic structure diagram of c ++program 2.To display HELLO msg on screen. 3.To display welcome on screen. 4.Declare structure for book 5.Declare & display structure for employee. 6.Array of structure
<b>2.0.Begning with c++</b> 2.1.Structure of c++ 2.2.Applications of c++ 2.3.Simple c++ programs 2.4. Basic & user defined data type 2.5.Tokens,Expressions,Control structure 2.6.Insertion & Extraction operator	1.Read & display data 2.Calculate area of rectangle 3.Calculate addition of two no. 4.Calculate area of circle. 5.To check whether no is positive or negative. 6.To check whether no is even or odd. 7. Display 0 to 5 number using for loop 8.Display 10 to 0 number using while loop 9.Menu driven prog for arithmetic operations 10.Greatest no among 3 no.
<b>3.0. Functions in C++</b> 3.1. Default argument 3.2. Function prototype 3.3. Inline functions 3.4. Friend function	1.Declare & displaydata using functions. 2.Swapping of two no using call by value. 3.Swapping of two no using call by reference 4.Calculate area of circle using inline function. 5.Calculate factorial of a given number. 6.Calculate product of two real & integer no using friend function.
<b>4.0. Classes &amp; object</b> 4.1. Specifying class 4.2. Member variable & member function 4.3. Nesting of member function 4.4 .Static data member 4.5 .Static member function 4.6. object as function argument	1.Read & .Display data using inside method. 2.Read & display student information using outside method. 3.Array of class 4.Display data using static variable.
<b>5.0.Constructor &amp; destructor</b> 5.1.Definations 5.2.Types of constructor 5.3.Destructor 5.4.Default value parameter	1.Calculate Salary of employee. 2.calculate simple interest using default value



<b>6.0.Operator overloading</b> 6.1.Unary operator 6.2. Binary operator 6.3. string functions using overloading 6.4.Rules for operator overloading	1.Unary minus operator. 2.length function 4.Reverse function
<b>7.0. Inheritance</b> 7.1. Concept of base class & derived class. 7.2.Visibility mode 7.3. Single inheritance 7.4. Multiple inheritance 7.5. Multilevel inheritance 7.6. Hybrid inheritance 7.7.Hierarchical inheritance 7.8.Virtual base class 7.9.Abstract class	1.Display Student information using single inheritance. 2.multilevel 3.multiple 4.Hybrid 5.Virtual base class
<b>8.0. Polymorphism</b> 8.1.Pointer 8.2.Pointer to object 8.3.This pointer 8.4.Compile & run time binding 8.5.Virtual functions 8.6.Pure virtual functions 8.7.Pointer to derived classes 8.8.Overloading & overriding	1.Declare & display data using pointer. 2.Pointer to object 3.Display memory address using pointer
<b>9.0. Template</b> 9.1. Class template 9.2.Function template 9.3.Member functions template	1.Display data using class template 2.Display data using function template

Text Books:

1. Y.P.Kanetkar ,“Let us ‘C’”:
2. B. S. Gottfried, Schaum's Outline of Theory and Problems of Programming with C,  
Tata McGraw Hill, 1995.
3. Kerningham and Ritchie, The C Programming Language, Prentice Hall, 1991.
4. Ramkumar and Agrawal, Programming in ANSI C, Tata McGraw Hill, 1996.
5. Advance “C” by Schaum series
6. “C” Programming by Kanetkar
7. K.R Venugopal ‘Mastering C++’, Tata Mcgrawhill1997

References:

1. B.Stroustrup ‘C++ Programming Language’ (3rd Edition). Addison Wesley, 1997
2. B.chandra Narosa ‘A Treatise On Object Oriented programming using C++’-  
Publications, 1998
3. Herbert Schildt, “The Complete Reference CN”, Tata McGraw-Hili, 2001.

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