Swami Ramanand Teerth Marathwada University, Nanded
Vishnupuri, Nanded (M.S.)

Choice Based Credit System

(CBCS Pattern)

Syllabus

B. Sc I Year (Computer Science)

(CBCS Pattern)

Effective from Academic Year (2016-2017)

Syllabus of First Year

B.Sc. Computer Science/Information Technology (Optional)

Semester	Subject Code	Course Name	Contact Hours			Total Credits
			Lecture(L)	Tutorial(T)	Practical(P)	
Semester – I	BCSITO01	**Problem Solving Using Computers**	3	--	--	02
	BCSITO02	**Web Page Designing Through HTML**	3	--	--	02
Semester – II	BCSITO03	**Programming in C**	3	--	--	02
	BCSITO04	**Analysis of Algorithm & Data Structure**	3	--	--	02
	BCSITO05	**Computer LAB-I**	--	--	04	04
	BCSITO06	**Basic Mathematics (Audit Course)**	3	--	--	--
					Total	12

Evaluation Scheme

Theory/ Practical	Semester /Annual	Semester No.	Paper No.	Title of the Paper	Marks						Min. Lectures / Week
					MCQ	Internal	Experiment	Oral	Record Book	Total	
Theory	Semester	I	I	Problem Solving Using Computers	40	10	---	---	---	50	03
			II	Web Page Designing Through HTML	40	10	---	---	---	50	03
		II	III	Programming in C	40	10	---	---	---	50	03
			IV	Analysis of Algorithm & Data Structure	40	10	---	---	---	50	03
Practical	Annual	-	V	Computer LAB-I	---	---	75	15	10	100	03
	Annual	**I & II**		**Basic Mathematics (Audit Course)**	---	---	---	---	---	----	03
Total					160	40	75	15	10	300	---
Total Marks for Theory = 50+50+50+50 = **200**					Total Lectures / Week /Division for Theory = **06**						
Total Marks for Practical =50					Total Lectures / Week / Batch for Practical = **03**						
Total Marks for FY = 200+50 = 250					Minimum Lectures / Week for FY = **09**						
Computer LAB-I: Practical Based On **Papers II & III (HTML & C Programming)**											

Paper No–I

Problem Solving Using Computers

(Marks: 50 Periods: 40)

1. **Computer Fundamentals** (06 Periods)
   Introduction to Computers, Block diagram of Computer, Characteristics of Computers, I/O Devices, I/O ports.
2. **Problem Solving Aspects** (08 Periods)
   Introduction to Algorithm, Top Down Designing, Implementation of Algorithm, Analysis of Algorithm, Flowchart, Principals of Flowcharts, Flowcharts Symbols.
3. **Fundamentals of Algorithms** (06 Periods)
   Exchanging value of variables, counting numbers, Summation of set of numbers, Factorial computations, Fibonacci number, Reverse of Digits.
4. **Factoring Methods** (06 Periods)
   Finding square root of numbers, smallest divisor of integers, greatest common divisor, generation of prime numbers, prime factor.
5. **Array Techniques** (08 Periods)
   Introduction to Array, types of Array, Memory Representation of Array, Reverse of Array, Array counting, Finding maximum and minimum element from Array
6. **Searching & Sorting Techniques** (06 Periods)
   Searching Techniques, linear search, binary search, Sorting Techniques:-bubble sort, selection sort.

Text book: 1. How to Solve it by Computer , Dromy R.J
2. Data Structure by Lipschutz Shaum Series

Reference Book: 1. Computer Fundamental by Anita Goel
2. Fundamentals of Computer by Dr. Bichkar & Dr. Sontakke

Paper No–II

Web Page Designing Through HTML

(Marks: 50 Periods: 40)

1. **Introduction to Web and Website** (06 periods)
   Introduction to Internet, Application and importance of Internet, www, URL, Web Browsers, web server, objectives of website, basic interface design, developing a story board for website, Navigation and links within website, checklist for designing.

2. **Introduction to HTML** (06 periods)
   Introduction to HTML, Basic elements, List- ordered/ Numbered list, Unordered/ Bulleted list, Definition list, Nesting list, Linking HTML pages, linking to URL, Text Formatting, Text Alignment, Character Styles, Fonts and Font Sizes, Using colors for the Web, preformatted text, Horizontal line, line break, Displaying special characters.
3. **Images in HTML** (06 periods)
   Images in HTML pages, Embedding inline images and external images, images and text alignment, images and links, alternative tags for images, using image as background, displaying images with heights and width dimensions, images preview, image for the web, reducing file size of image file, decreasing the file size by reducing the colour depth of image file,
4. **Tables in HTML** (06 periods)
   Introduction to tables, Features of tables, Tables in HTML, components of table, creating table, table cell and border, table and cell color,
5. **Frames, Image Maps** (06 periods)
   Introduction to Frames, Creating frames, Frames attributes and linking of frames, complex framesets, Inline frames.
6. **Forms and CGI Scripts** (06 periods)
   Introduction to forms, form design, text input fields, radio buttons, check box buttons, and submit button, additional layout features (select tag, Text AREA tag, and Hidden fields)

Reference books:

1. Web Publishing by Mnica D’ Souza, Jude D’ Souza (TMH Publication)
2. The complete reference HTML & CSS by T.A. Powell (TMH Publication)
3. HTML, DHTML, JavaScript, Perl CGI by IVAN Bayroos (BPB Publication)

Paper- III

Programming in C

(Marks : 50 Periods : 40)

1. **Introduction to C** (05 periods)

Introduction, Character set, C tokens, Data types, Constant, Variables, declaration of storage class, Input/Output Statement, operators, Hierarchy of Operation, Structure of C program.

2. **The Decision and Looping, Control Structure** (08 periods)

If Statement, If-Else statement, Nesting of If-Else, else-if ladder, Switch Statement, Goto. While loop, Do-While loop, For loop.

3. **Arrays and Pointers** (05 periods)

Introduction to Array, One-dimensional arrays: Declaration & Initialization, Two-dimensional arrays: Declaration & Initialization, Multi-dimensional arrays

Introduction, understanding pointers, accessing address of variable, declaring pointer variables, initialization of pointer variable

4. **Storage Classes** (02 periods)

Automatic, Register, Static, Scope rules.

5. **Functions** (07 periods)

Introduction, Definition of function, return values and their types, function calls, function declaration, recursion, passing arrays to functions,What are string, Standard Library string functions: strlen(), strcpy(),strcmp(), strcat().

6. **Structure and Union** (09 periods)

Introduction, defining a structure , defining a structure variable, accessing structure members, initialization of structure, structure within structure, union, Introduction to File Handling.

Reference Books:

1. C programming by B. Gottfried, Schaum's outline series
2.Programming in ANSI C by E. Balaguruswamy, TATA MCGRAW Hill Publication.
3. Let US C by Yeshwant Kanetkar, BPB Publication.
4. Programming in ANSI and Turbo C by Prof. Kamthane, Pearson Education.

Paper No –IV

Analysis of Algorithm and Data Structure

(Marks : 50 Periods : 40)

1. **Role of Algorithms in Computing** (08 periods)
   Introduction, Algorithms as a technology, designing Algorithm, divide and conquer technique/ Approach
2. **Introduction to Data Structure** (08 periods)
   Introduction, Elementry data organization, data structure operations, mathematical notations and functions, Algorithmic notations, control structure.
3. **Linked List** (08 periods)
   Introduction, Representation of linked list in memory, Traversing, Searching, Unsorted link list, Inserting after given node, deleting node with a given item of information.
4. **Stack and Queue** (08 periods)
   Introduction, Memory representation of Stack, Insert element in Stack_PUSH, Delete element from Stack_POP.
   Queue: Introduction, Memory Representation, Insert & Delete operation.
5. **Trees** (08 periods)
   Introduction, Binary tree & it's Memory representation, Insertion & Deletion of nodes in binary tree, Threaded binary tree.
6. **Graphs** (08 periods)
   Introduction, Memory Representation of graphs, types of graphs, Warshall's Algorithm.

Text Book:

1. Data Structure by lipschtz
2. An Introduction to Data Structure with Application by Jean Paul
3. Introduction to Algorithms, Cormen Chatles E. Leiserson, PHI Edition.

Paper No. V
Laboratory Work based on Paper No. II & III

Marks 50

Practical's based on HTML & C Programming (Follow Lab Manual)

Basic Mathematics (Audit Course) Periods: 40

(Totally internal evaluation, and evaluation is done by Assigning, Tutorials / Home Assignments / Tests)

Unit –I

Binomial theorem: Introduction, Binomial Theorem for positive Integral Indices, general and middle terms, **Sequence and series:** Introduction to sequence and series,AP,GP,relationship between A.M and G.M, Sum to n terms of special series.

Unit –II

Limits and Derivatives: Introduction, Intuitive Idea of Derivatives, Limits, Limits of Trigonometric Functions, Derivatives

Differentiation: Definition: derivative, derivative at a point, geometrical significance of derivative, physical significance (velocity as a rate of change of displacement), derivatives from first principle - of trigonometric functions, logarithmic functions, algebraic functions, exponential functions, rules of differentiation – derivative of sum, difference, product and quotient.
Integration: Definition of integration as anti derivative, geometrical interpretation of indefinite integrals, algebra of integrals – integrals of some standard functions, rules of integration.

Unit –III

Unit- IV Determinants

Revision, determinant of order three,definition, expansion, properties of determinants, minors & co-factors,applications of determinants, condition of consistency, area of a triangle, Cramer'srule for system of equations in three variables.

Unit –V Matrices

Introduction, concepts, notations, order, types of matrices – zero matrix, row matrix, column matrix, square matrix, determinant of a square matrix, diagonal matrix, scalar matrix, identity matrix, triangular matrices, singular & non-singular matrices, transpose of a matrix, symmetric & skew symmetric

matrices, operations on matrices – equality, addition, subtraction, multiplication of a matrix by a scalar, simple properties, multiplication of matrices – definition, properties of matrix multiplication, properties of transpose of a matrix -(A')' = A, (KA)' = KA',(AB)' = B'A'

Unit –VI Permutations & combinations

Introduction, fundamental principle of counting, factorial notation, permutations, when all r objects are distinct, when all r objects are not distinct, circular permutations, simple applications, combinations – definition, properties, relations between permutations and combinations, simple applications.

Reference Book:

NCERT Books and Maharashtra State board standard text (Syllabus is based on 11^{th} and 12^{th} Mathematics)

***Note: This course is exempted if the student had passed the HSC with mathematics**