

PERIYAR E.V.R. COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI - 620023							
DEPARTMENT OF COMPUTER SCIENCE							
B.SC. COMPUTER SCIENCE - MCBCS SYLLABUS 2015-16 ONWARDS							
Sl.No	Part	Course		Hours	Credits	Int.	Ext.
SEMESTER - I							
1	I		TAMIL - I	6	3	25	75
2	II		ENGLISH - I	6	3	25	75
3	III	Core - I	Major : C Programming	6	5	25	75
4	III	Core - II	Major Practical - I: C and C++ Programming Lab	2	-	-	-
5	III	Allied - I	Mathematics Paper - I	4	4	25	75
6	III	Allied - II	Mathematics Paper - II	2	-	-	-
7	IV		Value Education	2	2	25	75
8	IV	Skill Based Elective - I	Fundamentals of Computer Science	2	4	25	75
			Total	30	21	150	450
SEMESTER - II							
9	I		TAMIL - II	6	3	25	75
10	II		ENGLISH - II	6	3	25	75
11	III	Core - III	Major : C++ Programming	6	4	25	75
12	III	Core - IV	Major Practical - I: C and C++ Programming Lab	4	4	25	75
13	III	Allied - II	Mathematics Paper – II	2	3	25	75
14	III	Allied - III	Mathematics Paper - III	4	4	25	75
15	IV		Environmental Studies	2	2	25	75
			Total	30	23	175	525
SEMESTER – III							
16	I		TAMIL - III	6	3	25	75
17	II		ENGLISH – III	6	3	25	75
18	III	Core - V	Major : Java programming	4	4	25	75
19	III	Core - VI	Major Practical – II: Java and VB Programming Lab	2	-	-	-
20	III	Allied - IV	Physics Paper – I	4	3	25	75
21	III	Allied - V	Physics Practical	2	-	-	-
22	III	Major Elective - I	Introduction to Computer Organization	4	5	25	75
23	IV	Skill Based Elective - II	Documentation and Spread sheet	2	4	25	75
			Total	30	22	150	450
SEMESTER – IV							
24	I		TAMIL - IV	6	3	25	75
25	II		ENGLISH – IV	6	3	25	75
26	III	Core - VII	Major : Visual Basic Programming	6	4	25	75
27	III	Core - VIII	Major Practical - II: Java and VB Programming Lab	4	4	25	75
28	III	Allied -V	Physics Paper-II	2	3	25	75
29	III	Allied-VI	Physics Practical	4	3	25	75
30	III	Non Major Elective-I	Fundamentals of information Technology	2	2	25	75
			Total	30	22	175	525

SEMESTER - V							
31	III	Core - IX	Fundamentals of Microprocessors	6	5	25	75
32	III	Core - X	Principles of Operating Systems	6	5	25	75
33	III	Core - XI	Discrete Mathematics	6	4	25	75
34	III	Core - XII	Major Practical -III: Digital Electronics & Microprocessor Lab	4	4	25	75
35	III	Major Elective - II	Data Structures and Algorithms	5	5	25	75
36	IV	Non-Major Elective - II	Web Designing	2	2	25	75
37	V		Extension Activities	1	1	25	75
			Total	30	26	175	525
SEMESTER - VI							
38	III	Core - XIII	Data Base Systems	6	5	25	75
39	III	Core - XIV	Computer Graphics	6	4	25	75
40	III	Core - XV	Software Engineering	5	4	25	75
41	III	Core - XVI	Major Practical - IV: SQL and Web Designing Lab	5	4	25	75
42	III	Major Elective- III	Computer Networks	5	4	25	75
43	IV	Skill Based Elective -III	Web Design using HTML	2	4	25	75
44	V		Gender Equality	1	1	25	75
			Total	30	26	175	525
			Grand Total	180	140	1000	3000

Course:	B.Sc.	Part : III	Core : I	Semester:	I
Major :	Computer Science	C Programming		Credit :	5
				Hours :	6

Scope & Objective : To impart the features and syntax of the C programming language and to train the students to write efficient □programs in C

Unit : 1 Features of C - Structure of a C Programs – C tokens - Data types - Operators and Expression - Simple I/O Statements - Formatted I/O.

Unit : 2 Control structures - if else - go to – looping structures-while - do...while - for statements - switch & case statement - continue and break.

Unit : 3 Arrays and manipulations – One and Two dimensional arrays-character strings - String manipulations - Functions - user defined functions - parameters and parameter passing - Scope of variables - Recursion

Unit : 4 Structures and Unions - Pointers - Declarations - Accessing through pointers - pointers and strings - Pointers and □functions - Pointers and structures.

Unit : 5 Files - Text file-Sequential files- I/O Operations - Random Access files - pre-processor - macros - include directories - Compiler control □directives.

Text Book:

1. Programming in C, E.Balagurusamy, Tata McGraw Hill Publishing Company, New Delhi.

Reference Book:

1. Programming with C, Ravichandran, New Age International Company, New Delhi.

Course:	B.Sc.	Part : III	Core : II	Semester:	I
Major :	Computer Science	Major Practical I: C and C++ Programming Lab		Credit :	-
				Hours :	2

C Programming Lab (I Semester)

1. Simple Expression Evaluation (Odd/ Even/ Sum of N numbers)
2. Quadratic Equation (using IF, Switch...Case)
3. Problems using looping structure
4. Problems using single dimensional array (sorting of numbers)
5. Matrix Manipulations (Addition, Subtraction, Multiplication)
6. Polynomial Addition
7. String Manipulation
8. Simple Programs using User Defined Functions
9. Problems working with pointers
10. Problems using Structures
11. Working with Text File, Sequential file and Random Access File
12. Problems using command line arguments

C++ Programming Lab (II Semester)

1. Function using
 - a) Call by value
 - b) Call by Reference
 - C) Returning different data types
 - d) Recursive Call
2. Simple Programs for:
 - a) Function Prototype
 - b) Function Overloading
 - c) Default Arguments
 - d) Inline Functions
3. Simple programs for object and class creation (Arrays of objects, static data members)
4. Create an Object with All types of Constructors and Destructors
5. Single and Multilevel inheritance
6. Operator overloading (unary and binary)
7. File Processing

Note :

Practical examination will be conducted at the end of II Semester

Course:	B.Sc.	Part : IV	Skill Based Elective-I	Semester:	I
Major :	Computer Science	Fundamentals of Computer Science		Credit :	4
				Hours :	2

Scope & Objective : To impart the introductory concepts of computer and programming concepts.

Unit : 1 Introduction to Computers: Evolution of Computers, Generation of Computers, Classification of Computers Analog Digital and Hybrid Computers, Classification of Computer: Super Computers, Mainframe Computers, Personal Computers (Different Types) and Terminals (Different Types), Characteristics of Computers, Block Diagram of a Digital Computer.

Unit : 2 Introduction to Number system: Decimal, Binary, and Hexadecimal, Number system conversion: decimal to binary, binary to decimal- binary 1's complement and 2's complement 3 bit binary negative numbers- floating Point numbers: Mantissa and Exponential format- ASCII code.

Unit : 3 Memory: Memory Hierarchy, Primary Memory-Volatile and non-volatile memory, RAM and ROM, Input / Output Devices: Input Devices-KeyBoard, Mouse, Output Devices – VDU, Printers. Introduction to Programming Concepts: Types of Programming Languages, Software, Application software and System Software, Structured Programming, Algorithms, Procedures and Flowchart with simple examples.

Text Book:

1. Rajaraman, V. Fundamentals of Computers, 2nd Edition. Prentice Hall India Limited

Course:	B.Sc.	Part : III	Core : III	Semester:	II
Major :	Computer Science	C++ Programming		Credit :	4
				Hours :	6

Scope & Objective : To introduce the concepts of Object Oriented Programming and to familiarize the students to the syntax and features of C++ that support OOP.

Unit : I Basic concepts of OOP - Benefits of OOP - OOP Languages - Application of OOP - Beginning with C++ - Structure of C++ Program - C++ tokens- Keywords - Data Types - Variable Declaration - dynamic initialization of Variables - Scope resolution operators - Memory management operators - Manipulators - Type cast operator.

Unit : II Classes and Objects - Function in C++ - Function prototyping - Call by reference - Return by reference - Inline function - Default arguments - Function overloading - Friend functions Static data members and member functions - Array of objects - Constructor - Copy constructor - Destructor.

Unit : III Operator overloading - Overloading operators using friend function - Inheritance – All types of inheritance-Virtual base classes-Abstract Classes.

Unit : IV Pointers, Virtual Functions and Polymorphism: - Introduction – Pointers – Pointers to Objects – this Pointer – Pointers to Derived Classes – Virtual Functions and Pure Virtual Functions – Managing Console I/O Operations: – Introduction – C++ Streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operations – Managing Output with Manipulators.

Unit : V Working With Files: - Introduction – Classes for File Stream Operations – File Open and Close – Detecting EOF –File Modes – File Pointers and their Manipulations – Sequential I/O Operations – Updating a File – Error Handling – Command-line Arguments – Templates: Introduction – Class Templates – Multiple Parameters -Function Templates – Function Templates with Multiple Parameters – Overloading of Template Functions – Member Function Templates – Non-Type Template Arguments

Text Book:

1. Object Oriented Programming with C++, E. Balagurusamy, 3rd Edition, Tata McGraw Hill, New Delhi, 2006.

Reference Book:

1. Programming with C++, Ravichandran, New Age International Company, New Delhi.

Course:	B.Sc.	Part : III	Core : V	Semester:	III
Major :	Computer Science	JAVA PROGRAMMING		Credit :	4
				Hours :	4

Scope & Objective : To introduce the concepts of OOPS and to familiarize with the features of Java that make it platform independent and also to perform applet programming.

Unit : I OOP and Java : Objects and classes - Encapsulation - Inheritance - Polymorphism - Java Language and features - Creating and Executing a Java Application - The Primaries : Character set - Tokens - Constants and data types - Variables - Operators - Expressions - Strings - I/O statements - Control statements: if statement - switch statement - while statement - do..While statement - for statement.

Unit : II One and two dimensional arrays - Methods - Method • overloading - Classes and Objects: General form of a • class - Creation of objects - Usage of constructors - 'this' • keyword - constructor overloading - copy constructors - static • data members - static methods - 'finalize()' method . String class:- Construcion of strings – charAt() nad indexOf() methods –Extracting the substrings case conversions- character replacement in a string –getChars() and getBytes() methods- comparison of strings. String Buffer class:- Length() and capacity() methods ,charAt() and setCharAt() Methods- setLength()- getChars()_ insert() methods.

Unit : III Inheritance and Polymorphism: Inheriting the variables in a class - Inheriting the methods in a class - Inheritance and Constructors - Abstract classes - Final classes - Interfaces and Packages: Structure of an interface - Implementation of an interface inheritance - The package statement - placing classes in a package - package hierarchy - import statement - hiding the classes in a package - Access control modifiers.

Unit : IV Exception handling - Default and User-defined Exception handling mechanisms - Exception and Error classes - Catch block searching pattern - 'throw' statement - 'throws' clause - Custom exceptions. Applets: Introduction - The life cycle of an

applet - The Applet class - Development and Execution of a simple applet -
syntax of Applet tags - Methods in the Graphics class

Unit : V AWT - □Events - Listeners - Event handling methods - Inheritance
hierarchy of control classes - Labels - Buttons - Checkbox - □Radio Buttons -
Choice control - List Control - Scrollbars.

Text Book:

01. Programming with Java, C.Muthu, Vijay Nicole, Imprints Pvt. Ltd., 2004.

Reference Books:

01. Java 2 Complete Reference, Herbert Schildt, TMH, Fourth Edn. 2002.

02. Programming with Java A Primer, E.Balagurusamy, Tata Mcgraw Hill,

Course:	B.Sc.	Part : III	Core -VI	Semester:	III
Major :	Computer Science	Major Practical II: Java and VB Programming Lab		Credit :	-
				Hours :	2

Java Programming Lab (III Semester)

1. Program to implement objects and class
2. Program to Illustrate various forms of constructors
3. Program to illustrate the use of method overloading and Method Overriding.
4. Program to implement the concept of Interfaces and packages.
5. Generate programs using exception.
6. Program using methods in String and String Buffer Class.
7. Applet – Usage of <param> tag
8. Usage of AWT Components.
9. Program using Graphics commands

VB Programming Lab (IV Semester)

1. Simple programs using Input box and Message Box
2. Usage of text box ,label and buttons
3. Usage of Functions and Procedures
4. Usage Timer Control
5. Manipulation of various String Functions
6. Manipulations of various Numeric Functions
7. Usage of Image Control
8. Usage of Picture control
9. Usage of list and combo box
10. Usage of File, Directory and Drive list box
11. Database connectivity

Note :

Practical examination will be conducted at the end of IV Semester

Course:	B.Sc.	Part : III	Major Elective - I	Semester	III
Major :	Computer Science	Introduction to Computer Organization		Credits	5
				Hours	4

Scope & Objective : To understand the basic concepts of number systems, Boolean algebra, Gates and other related topics and to realize the method in building a computer system.

Unit : 1 Number Systems: Decimal, Binary, Octal & Hexadecimal numbers – Number conversions.
Signed Binary Number – Binary Arithmetic – Codes: Classification of Codes – Tables for BCD 8421, 2421, XS3, and Gray Codes.

Unit : 2 Boolean Algebra and Logic Gates: Fundamental concepts – Boolean Constants and Variables.
Logic gates – Truth Tables – Types of Gates – Basic Laws of Boolean algebra – Boolean Theorems – De Morgan's theorems – Boolean Expression for Logic Circuits – Implementing Circuits from Boolean Expressions
Standard Representation for Logical Functions – Minterm and Maxterm – Simplification of Boolean expressions using Laws and Theorems – Karnaugh Map Representation and Simplification up to four variables for SOP and POS – SOP and POS with Don't Care Condition.

Unit : 3 Combinational Logic Circuits: Design Procedure – Adders: Half-Adder, Full Adder – Subtractor: Half-Subtractor, Full Subtractor.
Multiplexer: Concept and 4:1 multiplexer – Demultiplexer: Concept and 1:4 demultiplexer
Sequential Logic Circuits: Introduction – Basic Flip-Flops: Clocked SR, JK, Type D and Type T – Characteristics of Flip-Flop.

- Unit : 4 Shift Registers – Binary Counters – Encoder – Decoder
Memory: Memory Hierarchy – Main Memory – Auxiliary Memory –
Associative Memory – Cache Memory – Virtual Memory – Properties of Memory
(From Text Book-1).
- Unit : 5 Computer Architecture: Instruction Formats – Data Transfer and Manipulation
Instructions and data – Addressing modes.

Text Books:Units 1,2, and 3:

1. Digital Electronics, G.K. Kharate, Oxford University Press, 2010

Units 4 and 5:

2. Computer System Architecture, M. Morris Mano, Prentice Hall of India
Private Ltd., New Delhi, 1999

Reference Book:

1. Digital Computer Fundamentals, Thomas C. Bartee, McGraw Hill International
Publications, Second Edition, 1986

Course:	B.Sc.	Part : IV	Skill Based Elective-II	Semester:	III
Major :	Computer Science	Documentation and Spreadsheet		Credit :	4
				Hours :	2

Scope & Objective : To make the Students to understand the operation of word processing and Spread sheet.

Unit : I Introduction to Documentation - Opening, Saving and Printing Document – Tool Bars - Editing: Clip-board, Delete, Cut-Copy-Paste, Undo/ Redo operations – Document Views – Ruler & Gridlines – Zoom.Common Formatting Functions: Font Properties - Alignment - High-lighting text - Bullets and Numbering - Indentation - Formatting Paragraph - Find & Replace.

Unit : II Inserting: Blank Page & Page Break, Picture, ClipArt, WordArt and Special symbols. Table: Inserting Rows and Columns – Merging – Cell Alignment – Auto fit – Table Borders. Page Layout: Orientation – Margins: Top, Left, Gutter – Header & Footer - Review: Spelling & Grammar.

Unit : III Introduction to Spreadsheet – Spread sheet terminology-Opening, Saving and Closing Workbook - Entering Data in Spreadsheet - Copying the Data- Formatting the Data - Editing the Worksheet. Calculation in a worksheet - Functions, Formulae and Copying formulae

Date & Time: DATE, MONTH, NOW and TIME

Text: BAHTTEXT, CONCATENATE, DOLLAR, LEFT, RIGHT,

LOWER, UPPER, PROPER, VALUE and TRIM

Mathematical: ABS, INT/ROUND/TRUNC, FLOOR/CEILING, POWER,

SIGN, SQRT, RAND, SUM, SIN/COS/TAN and

DEGREES/RADIANS

Statistics: AVERAGE/ MEDIAN/MODE, COUNT and MAX/MIN

Engineering: BIN2DEC/ BIN2HEX/ BIN2OCT, DEC2BIN/ DEC2HEX/

DEC2OCT, HEX2BIN/ HEX2DEC/ HEX2OCT and OCT2BIN/

OCT2DEC/ OCT2HEX

Working with Charts, Types of Charts, Inserting Charts, Simple Formatting of Charts.

Text Book:

1. DTP Course Kit, Vikas Gupta, Dreamtech Press, 2009

Course:	B.Sc.	Part : III	Core : VII	Semester:	IV
Major :	Computer Science	VISUAL BASIC PROGRAMMING		Credit :	4
				Hours :	6

Scope & Objective : To introduce the concept of graphical user interfaces and get acquainted with the features of • Visual Basic that makes it a powerful tool in developing GUI applications.

Unit : I

Fundamentals Of Programming In Visual Basic : Visual Basic Objects – Text Box – Command Button- Label-Picture Visual Basic Events: An Event Procedure - Numbers – Arithmetic Operators- Variables - Print Method - Strings : Concatenation - Input And Output: Reading Data From Files – Input From Input Box-Formatting Output With Print Zones – Tab Function-Using Message Box For Output Built-In Functions: Numeric Functions – Sqr,Int,Round-String Functions :- Left ,Mid,Right ,Ucase, Lcase,Trim, Len Instr- Format Functions- Generating Random Numbers-Rnd.

Unit : II

General Procedures : Sub Procedures:Variables And Expressions As Arguments - Passing Values Back From Sub Procedures – Passing By Value – Local Variables –Form-Level Variables- Function Procedures.Decisions : Relational And Logical Operators - If Blocks - Select Case Blocks . Repetition - Do Loops - Processing Lists Of Data With Do Loops –Eof Function-Counters And Accumulators- Flags – Nested Loops- For...Next Loops.

Unit : III

Arrays - Creating And Accessing Arrays - Using Arrays - :Ordered Arrays-Passing Arrays Between Procedures- Control Arrays-Control Array Event Procedures-Creating Control Arrays At Runtime Two-Dimensional Arrays
Sequential Files: Creating A Sequential File- Adding Items To A Sequential File -Random-Access Files:- User Defined Data Types : Fixed Length String- Records-Random-Access Files

Unit : IV

The Graphical Display Of Data : Introduction To Graphics – Specifying A Coordinate Systems- Graphics Method For Drawing Lines,Points And Circle-Positioning Text- Line Charts - Line Styling- Bar Charts - Pie Charts -Controls And Objects - List Boxes And Combo Boxes-Diriv, Directory And File List Box Nine Elementary Controls - Frame Control- Check Box Control – The Option Button Control – The Horizontal And Vertical Scrollbars – The Timer Control-Shape Control- Line Control – Image Control

Unit : V Five Additional Objects- Flexgrid Control – Menu Control - – Clipboard Object - Multiple Forms- Common Dialog Controls -Database Management - An Introduction To Databases - The Data Control- Validation Event Relational Databases And SQL - Three Additional Data-Bound Controls- Creating And Designing Databases

Text Book:

Computer Programming Concepts and Visual Basic ,David I. Schneider,
Pearson Custom Publishing,

Reference Book:

VB 6 from the ground up, Gary Cornell, TMH Edition, New Delhi.

Course:	B.Sc.	Part : III	Non-Major Elective - I	Semester	IV
Major :	Computer Science	Fundamentals of Information Technology		Credits	2
				Hours	2

Scope & Objective : To explore the concepts of information Technology and communication via computers.

Unit : 1 Introduction to Computers: Introduction - importance of computers - characteristics of computers.

Unit : 2 Classification of digital computers - Anatomy of digital Computers.

Unit : 3 Input Devices - Output Devices - Programming Languages - Operating Systems.

Unit : 4 Computer Networks: Types of Networks - Network topology.

Unit : 5 Internet and World Wide Web.

Text Book:

1. Fundamentals of Information Technology, Alexis Leon & Mathews.

Reference Book:

1. Using Information Technology - A Practical introduction to computers and communication, Stacey Sawyer, Brian K Williams, Sarah E Hutchinson, 3rd Ed., TMH, 1999.

Course:	B.Sc.	Part : III	Major Core : IX	Semester:	V
Major :	Computer Science	FUNDAMENTALS OF MICROPROCESSORS		Credits :	5
				Hours :	6

Scope & Objective : To impart an in depth knowledge of the architecture and programming of the 8-bit microprocessor 8085 and to study how to interface the peripherals. To develop assembly language programs in 8085.

Unit : I Evolution of microprocessors - single chip microcomputers - Microprocessors applications - Programming Digital computers - Memory - Buses - Memory addressing capacity of CPU - • Microcomputers - Processor architecture - Intel 8085 - • instruction cycle - Timing diagram.

Unit : II Instruction set of Intel 8085 - instruction and data formats - Addressing modes - Status flags - Intel 8085 instructions - Programming of microprocessors - Assembly language - Assemblers - Stacks and subroutines - MACRO - microprogramming.

Unit : III Assembly language programming - Simple examples - Addition and Subtraction of binary and decimal numbers - Complement - • shift - Masking - Finding the largest and smallest numbers in an array - Arranging a series of numbers - Sum of a series of • numbers - Multiplication - Division - Multi byte addition and • Subtraction.

Unit : IV Peripheral devices and interfacing - Address space partitioning - Memory and I/O devices - I/O ports - Programmable peripheral interface - Programmable counter/interval timer - A/D • converter and D/A converter.

Unit : V Microprocessor applications - Delay subroutines – Delay subroutine using Register pair - Interfacing of 7 segment displays - Water level indicator - Microprocessor based traffic control.

Text Book:

1.Fundamental of Microprocessors and Microcomputers, Badri Ram, Fourth Revised Edition, 1993.

Reference Book:

1.Microprocessor Architecture, programming and applications with the 8085/8080A, Ramesh, S. Gaonkar, Wiley Eastern, 1990.

Course:	B.Sc.	Part : III	Core : X	Semester:	V
Major :	Computer Science	Principles of Operating Systems		Credits :	5
				Hours :	6

Scope & Objective : To gain a rich knowledge on the basic terminologies of Operating Systems and their resources.

Unit : I Operating systems - Evolution - Importance - Functions - Resource Manager - Different views of Operating Systems - I/O programming - Interrupt Structure and Processing.

Unit : II Memory Management - Single Contiguous - Partitioned - Relocate able partitioned - Paged - Demand Paged - Segmented Memory management schemes.

Unit : III Processor Management - State Model - Job Scheduling - Process Scheduling - Process Synchronization - Dead lock - Bankers Algorithm.

Unit : IV Device Management - Techniques for device management - I/O Traffic Controller - I/O Scheduler - I/o Device Handlers - Virtual Devices - Spooling.

Unit : V Information Management - Simple file System - General Model - Symbolic File System - BFS - Logical and Physical File Systems - Case Study: Unix Operating System.

Text Book: 01. Operating Systems, Stuart E Madnick and John J Donovan, TMH,2006 (Reprint)(Unit-I:Pages 1-20, Pages 52-70, Unit-II:Pages 105-181,Unit-III: Pages 209-262, Unit-IV: Pages 283-285, Pages 300-325, Unit-V: Pages 337-370).

02. Operating Systems - An overview, Deital and Deital, TMH, 2002(Unit-I: Pages 1-10, Pages 166-179, Unit-V: Pages 635-650).

Reference Book: 01. Operating Systems Principles, Milan and Milankovic, Wiley India Ltd, 2002.

Course:	B.Sc.	Part : III	Core : XI	Semester:	V
Major :	Computer Science	Discrete Mathematics		Credits :	4
				Hours :	6

Scope & Objective : To know the applications of set theory, graph theory, computer representations of graph and mathematical logics.

Unit : I Set theory: Introduction - Sets- Notations - descriptions of sets - Subsets - Venn diagram - Euler diagrams - Operations on Sets - Properties of set Operations - Verification of the basic laws by Venn diagrams - Principles of duality.

Unit : II Relations: Cartesian product of two sets - Relations - Representation of a relation – Operations on relations - Equivalence relations - Functions: Functions and operators - one-to-one - onto functions - special type of functions.

Unit : III : Mathematical Logic: Logical statement of Proposition – Types of Propositions – The Propositional Calculus – The Negation of a Proposition – Disjunction – Conjunction – Tautologies and Contradictions – Logical Equivalence – The Algebra of Propositions – Conditional Propositions – Converse, Inverse and Contrapositive Propositions – The Negation of a Conditional Proposition – Bi-conditional Propositions – Arguments.

Unit : IV **Graph Theory** :Introduction - Definition - Applications of graphs - finite and infinite graphs - incidence and degree – Isolated Vertex, Pendant Vertex and Null graph.**Paths and Circuits**: Isomorphism - Subgraphs - walk, path, and circuit - connected, disconnected graphs - components - Euler graphs - operations on graphs - more on Euler graphs - Hamiltonian paths and circuits.

Unit : V **Tree and Fundamental Circuits**: Trees – some properties of trees - pendant vertices in a tree - Distance and centre in a tree - Rooted and binary trees - Spanning trees - Fundamental circuits – finding all spanning trees of a graph - Cut-sets – Some properties of a cut-set – All cut-sets in a graph –Fundamental Circuits and cut-sets.

Text Book: 1. Discrete Mathematics, Dr. N. Sridharan, N. Chandrasekaran, The National Publishing Company 2000.(For **Unit- I**(Pages1.1 – 1.24) &**Unit- II** (Pages 2.1 -2.28, Pages 3.1 – 3.10)

2. Discrete mathematics, Vatssa, B.S., Wishwar Prakashan , A Division of Wiley Eastern Ltd., 3rd Edition (1988), New Delhi - 110 002.
(For **Unit-3**(Section 1.1 – 1.18))

3. Graphs theory with application to Engineering and Computer Science, Narsingh Deo, Prentice Hall of India, New Delhi (1993). (For **Unit- 4** (Pages 1 -9, Pages 14 – 17, Pages 19-34) and **Unit-5** (Pages(39 – 52 & 55- 75)).

Reference Book: 1. Modern Algebra, Arumugan and A.T.Issac, New Gamma Publication (1992), New Gamma Publication (1992).

2. Discrete Mathematics, M.K.Venkataraman, The National Publishing Company, 2004

Course:	B.Sc.	Part : III	CORE - XII	Semester:	V
Major :	Computer Science	Major Practical - III : Digital Electronics and Microprocessor Lab		Credits :	4
				Hours :	4

Scope & Objective : To give a broader practical knowledge on Digital Electronics and Microprocessor.

Digital Electronics:-

01. Study of Basic Gates AND, OR, NOT using ICs.
02. Study of Logic Gates NAND, NOR, XOR using ICs.
03. Half Adder and the Full Adder circuits using ICs.
04. Karnaugh Map Reduction Method.
05. Half Subtractor and the Full Subtractor circuits using ICs.
06. Universal properties of NAND & NOR gates.
07. Proving De Morgan's Laws using ICs.

Microprocessor:-

01. Add, Subtract, Multiply, and Divide the list of 8-Bit numbers.
02. Perform 16 bit addition of hexadecimal numbers
03. Find the Smallest and Largest elements from the given list.
04. Perform Multibyte Addition and Subtraction.
05. Copy one block of elements to another block.
06. Sort a given list of numbers in ascending order.
07. Add and subtract two 8-bit BCD numbers.
08. Perform multiplication by successive addition.
09. Perform division by successive Subtraction

Course:	B.Sc.	Part : III	Major Elective-II	Semester:	V
Major :	Computer Science	Data structures and Algorithms		Credits :	5
				Hours :	5

Scope & Objective : To give a fundamental knowledge on data structures and exposure to development of algorithms related to □data structures.

Unit : I Introduction: Elementary data organization, Data Structure definition, Data structure operations, Algorithms complexity and time-space tradeoffs. Mathematical Notation and functions, Algorithmic Notation, Control Structures
Strings: Introduction, strings, String operations, Pattern matching algorithms

Unit : II Arrays: Introduction, Linear arrays, Representation of linear array in memory, Array operations, Multidimensional arrays, Parallel arrays, Sparse matrix.
Linked List: Introduction, Array vs. linked list, Representation of linked lists in memory, Operations in a linked list, Header linked list, Two-way linked list, Garbage collection, Applications of linked lists.

Unit : III Stack: primitive operation on stack, algorithms for push and pop. Representation of Stack as Linked List and array, Stacks applications: polish notation, recursion. Introduction to queues, Primitive Operations on the Queues, Priority queue, Representation of Queues as Linked List and array, Applications of queue.

Unit : IV Trees - Basic Terminology, Binary Trees, Tree Representations using Array & Linked List, Basic operation on Binary tree, Traversal of binary trees:- In order, Pre order & post order, Applications of Binary tree, Tree traversals

Unit : V Sorting and searching : Introduction-Insertion sort, Selection Sort - Merge-sort, Radix sort, Searching and data Modification- Linear search , Binary search- Hashing

Text Book:

1. Seymour Lipschutz, “Data Structures”, Tata McGraw- Hill Publishing

Company Limited, Schaum's Outlines, New Delhi.

Reference Book:

1. Trembley, J.P. And Sorenson P.G., "An Introduction to Data Structures With Applications", McGraw- Hill International Student Edition, New York.
2. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Addison- Wesley New Delhi, 1987. (An Imprint Of Pearson Education), Mexico City.

Course:	B.Sc.	Part : IV	Non-Major Elective : II	Semester:	V
Major :	Computer Science	WEB DESIGNING		Credits :	2
				Hours :	2

Scope & Objective : To introduce the basic concepts of HTML and to design web pages using the different tags available

Unit : I Introduction To HTML: Designing A Home Page – HTML Document – Anchor Tag –Hyperlinks – Head and Body Sections – Header Section – Title – Links – Colourful Pages – Body Section – Heading – Horizontal Rule – Paragraph – Tabs – Images and Pictures.

Unit : II Lists and Their Types – Table Handling - Frames – Forms and Their Elements - Drop Down List - Check Boxes – Radio Button - Text Field – Text Area – Password, Hidden, Submit and Reset Buttons.

Unit : III DHTML and Style Sheets – Defining Styles – Elements of Styles – Linking A Style Sheet to AHTML Document – Inline Styles – External Style Sheets – Internal Style Sheets – Multiple Styles – Web Page Designing.

Text Books:

1. Programming the World Wide Web, Robert W. Sebesta, Pearson Education, Third Edition, 2007. (For Unit I)
2. World Wide Web Designing, C. Xavier, Tata McGraw Hill, 2000. (For Units I and III)

Reference Book

1. IVAN BAYROSS, Web enabled commercial application development using HTML, DHTML, Java script, Perl CGI, 2nd revised edition, BPB publishing, 2002

Course:	B.Sc.	Part : III	Core : XIII	Semester:	VI
Major :	Computer Science	DATABASE SYSTEMS		Credits :	5
				Hours :	6

Scope & Objective : Objectives: To understand the basic concepts and organization of a database and to impart basic knowledge on relational database.

Unit : I An overview of Database Management: Introduction-Database system – Database - Data independence-Architecture - Database Administrator - Database Management System-Entity Relationship model- Components- Examples.

Unit : II An introduction to Relational Databases: The Relational Model-Domains-Relation Values - Relation Variables, Relational Algebra - Overview of original Algebra - Closure revisited – Syntax-Semantics-Examples - Additional Operators - Grouping and Ungrouping-Relational Comparison, Relational Calculus-Tuple calculus - Domain Calculus.

Unit : III Integrity : Constraint Type - Attribute Constraints - Relvar Constraints-Database Constraints-Keys, Normalization: Introduction - Non loss Decomposition and Functional Dependencies - First, Second and Third Normal form - Dependency Preservation - BOYCE/CODD Normal form - Fourth Normal form - Fifth Normal form.

Unit : IV Manipulation in Database Management Systems: Table – Components - Create Table - Viewing Data in Table – Select – Where – Distinct - Order by - Creating a Table from a Table – Inserting data into a table from another table – Delete – Update - Modify Structure - Computation on Table Data - Arithmetic operators - Logical operators – Between - Like – In – dual - Aggregate function.

Unit : V Data Constraints: Types-Primary key-Foreign key-Column level-Null value-Unique-check-Defining different constraints on a table - Constraints in alter table-Default, Grouping Data from Table-Date format, Sub Queries, Join - Equi join - Self Join, Set operations-Union-Intersect and Minus, Create Index-view.

Text Book:

1. C.J.Date, “An Introduction to Database Systems”, Seventh Edition, Pearson Education, 2002, UNITS:I,II&III.
- 2.Ivan Bayross, “SQL, PL/SQL The Programming Language of SQL” , Third Edition, BPB Publications, New Delhi, 2008, UNITS: IV &V.

Reference Book:

1. Alexis Leon & Mathews Leon, “Database Management Systems”, Vikas Publishing House Ltd., New Delhi, 1999.
2. Elmasri & Navathe, Fundamentals of Database systems, Addison & Wesley, New Delhi.

Course:	B.Sc.	Part : III	Core : XIV	Semester:	VI
Major :	Computer Science	COMPUTER GRAPHICS		Credits :	4
				Hours :	6

Scope & Objective : To offer knowledge on basics to graphical techniques, raster graphics, two dimensional and three dimensional graphics.

Unit : 1 Computer - Aided Design – Presentation Graphics – Computer – Art - Entertainment – Education and Training-Visualization Image Processing-Graphical User Interface-Video Display Devices- Raster-Scan Systems-Random-Scan Systems-Graphics Monitors and Workstations-Input Devices-Hard –Copy Devices-Graphics Software.

Unit: 2 Output primitives: Point and Lines-Line – Drawing Algorithms – Circle -Generating Algorithms - Attributes of Output Primitives: Line Attributes -Curve Attributes - Color and Gray Scale levels - Area-Fill Attributes -Character Attributes-Bundled Attributes-Inquiry Functions- Concepts of Antialiasing.

Unit: 3 Two Dimensional Transformations: Basic Transformation Matrix Representations and Homogeneous Co-ordinates - Composite Transformations - Other Transformations.

The Viewing Pipeline – Window – to - Viewport Coordinate Transformation - Clipping Operations - Point Clipping - Line Clipping: Cohen - Sutherland Line clipping algorithm.

Unit: 4 Polygon clipping: Sutherland – Hodgeman polygon clipping algorithm -Curve Clipping - Text Clipping - Exterior Clipping.

The User Dialogue - Logical Classification of Input Devices - Locator Devices - Stroke Devices-String Devices - Valuator Devices - Choice Devices - Pick Devices - Interactive Picture - Construction Techniques.

Unit: 5 Three Dimensional Concepts: Three - Dimensional Cartesian Coordinate Systems – Three - dimensional Display Methods – Three Dimensional Graphics Packages – Three Dimensional Transformations: Translation, Scaling, Reflections and Shears.

Text Book:

1. Computer Graphics, Donald Hearn and M.Pauline Baker, PHI, New Delhi.

Reference Books:

1. Principles of Interactive Computer Graphics, William M.Newman and Robert F.Sproul (McGraw-Hill).
2. Interactive Computer Graphics Data Structures Algorithms and Languages, Giloi W.K.(PHI).

Course:	B.Sc.	Part : III	Core : XV	Semester:	VI
Major :	Computer Science	SOFTWARE ENGINEERING		Credits :	4
				Hours :	5

Scope & Objective : To introduce the basic concepts of Software Engineering and the various phases involved in Software development

Unit : I Introduction to software Engineering: Definitions - Size factors - Quality and Productivity Factors - Planning a Software Project: Problem definition - Developing a Solution Strategy - Planning the Development Process – Team Structure and Project Structure.

Unit : II Software Cost Estimation: Software Cost Factors – Software Cost Estimation Techniques – Software Requirements Definition: Software Requirements Specification-Formal Specification Techniques.

Unit : III Software Design: Fundamental Design Concepts - Modules and Modularization Criteria- Design Notations- Design Techniques - Structured Coding Techniques - Coding Style – Documentation and Guidelines.

Unit : IV Verification and Validation Techniques: Quality Assurance Walkthroughs and Inspection - Static Analysis – Symbolic Execution - Unit Testing and Debugging - System Testing.

Unit : V Software Maintenance: Enhancing Maintainability during development - Managerial Aspects of Software Maintenance -Configuration Management - Source code Metrics.

Text Book:

Richard Fairley, “Software Engineering Concepts”, Tata McGraw-Hill International Editions, New Delhi, 2007 (Reprint)

UNIT - Chapters

1 - 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4

2 - 3.1, 3.2, 4.1, 4.2

3 - 5.1, 5.2, 5.3, 5.4, 6.1, 6.2, 6.4

4 - 8.1, 8.2, 8.3, 8.4, 8.5, 8.6

5 - 9.1, 9.2, 9.3, 9.4

Reference Book:

Roger S.Pressman, “Software Engineering - A Practitioner's Approach”, McGraw-Hill International Editions, Singapore, 2005.

Course:	B.Sc.	Part : III	Core : XVI	Semester:	VI
Major :	Computer Science	Major Practical-IV: SQL and Web Designing Lab		Credits :	4
				Hours :	5

SQL Practical List

1. Data Definition Language: Create, Alter, Drop, Rename, Truncate
2. Constraints: Not Null, Unique Key, Primary Key, Foreign Key, Check, Dropping a Constraint, Enabling & Disabling.
3. Data Manipulation Language: Insert, Update, Delete, Select
4. SQL SELECT Statements: Selecting All Columns, Selecting Specific Columns, Column Alias, Concatenation Operator, Arithmetic Operators, Comparison Conditions, Logical Conditions, ORDER BY Clause
5. Functions: Single Row Functions, Character Functions, Number Functions, Date Functions, Conversion Functions, General Functions, Multiple Row Functions, Group Function Sub query: Sub query, Types of Sub query, Group Function, Having Clause
6. Joins: Equijoins, Non-Equijoins, Joining Three Tables, Self Joins, Left Outer Joins, Right Outer Joins, Full Outer Joins, Cross Joins, Natural Joins
Other Concepts: View, Index

HTML

01. Design a Web page using
 - a. Lists
 - b. Tables
 - c. Links
 - d. Frames and Framesets
 - e. Form Design
02. Create a web page using Cascading style sheets-
Embedded style sheets - Inline style sheets

Course:	B.Sc.	Part : III	Major Elective :III	Semester:	VI
Major :	Computer Science	COMPUTER NETWORKS		Credits :	4
				Hours :	5

Scope & Objective : To give the concepts of computer networking, networking models and their layered architecture and the use of different Protocols.

Unit : I Basic Concepts: Line Configuration - Topology - Transmission Modes - Categories of Networks - The OSI model - Layered architecture - Functions of the layers.

Unit : II Signals: Analog and Digital data - Analog and digital signals - Periodic and aperiodic signals - Analog signals - Digital Signals - Error detection & Correction: Types of Errors - Detection – VRC, LRC – CRC – Checksum – Error Correction.

Unit : III Data Link Layer Protocols: Asynchronous Protocols - Synchronous Protocols - Character Oriented Protocols - Bit Oriented Protocols - Switching: Circuit Switching - Packet Switching – Message Switching.

Unit : IV Networking and Internetworking Devices: Repeaters - Bridges - Routers - Gateways - Routing algorithms - Distance Vector Routing - Link State Routing.

Unit : V TCP/IP Protocol Suite: Overview - Network Layer – Addressing – Subnetting - Transport Layer - TCP & UDP – Application layer: BOOTP, DHCP – DNS – Telnet – FTP – TFTP – SMTP – SNMP - HTTP.

Text Book:

Behrouz A Forouzan, “Data Communications and Networking”, TMH, 2nd Edn.

Reference Book:

Computer Networks, Andrew S. Tanenbaum, “Computer Networks”, PHI.

Course:	B.Sc.	Part : IV	Skill Based Elective - III	Semester:	VI
Major :	Computer Science	Web Design using HTML		Credits :	4
				Hours :	2

Scope & Objective : To introduce the basic concepts of HTML and to design web pages using the different tags available

Unit : I Introduction To HTML: Designing A Home Page – HTML Document – Anchor Tag –Hyperlinks – Head and Body Sections – Header Section – Title – Prologue – Links – Colourful Pages – Comments – Body Section – Heading – Horizontal Rule – Paragraph – Tabs – Images and Pictures.

Unit : II Lists And Their Types – Nested Lists – Table Handling - Frames – Nested Framesets – Forms And Their Elements - Drop Down List - Check Boxes – Radio Button - Text Field –Text Area – Password, Hidden, Submit and Reset Buttons.

Unit : III DHTML And Style Sheets – Defining Styles – Elements Of Styles – Linking A Style Sheet To AHTML Document – Inline Styles – External Style Sheets – Internal Style Sheets – Multiple Styles – Web Page Designing.

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