

**GOVERNMENT ARTS COLLEGE (AUTONOMOUS), COIMBATORE - 641 018**  
**DEPARTMENT OF COMPUTER SCIENCE**  
**B. Sc., Computer Science Syllabi and Scheme of Examinations for the Students Admitted**  
**from 2015-2016 academic year onwards**

Semester	Part	Code	Title of the Paper	Hrs (wk)	Internal (CA) Marks	External (SE) Marks	Total Marks	SE – Min.	TPM	Credits
<b>I</b>	<b>I</b>	15TAM11L	<b>Part – I:</b> Language: Tamil I	6	25	75	100	30	40	3
	<b>II</b>	15ENG12L	<b>Part –II:</b> English I	6	25	75	100	30	40	3
	<b>III</b>	15BCS13C	<b>Core – 1:</b> Digital Computer Fundamentals	5	25	75	100	30	40	3
	<b>III</b>	15BCS14A	<b>Allied – 1:</b> Statistics and Numerical Methods	6	25	75	100	30	40	5
	<b>III</b>	15BCS15P	<b>Practical 1:</b> Office Automation Lab	5	40	60	100	24	40	2
	<b>IV</b>	15ENV1GE	Environmental Studies	2	25	75	100	30	40	2
				<b>30</b>			<b>600</b>			<b>18</b>
<b>II</b>	<b>I</b>	15TAM21L	<b>Part – I:</b> Language: Tamil II	6	25	75	100	30	40	3
	<b>II</b>	15ENG22L	<b>Part –II:</b> English II	6	25	75	100	30	40	3
	<b>III</b>	15BCS23C	<b>Core – 2:</b> COBOL Programming	5	25	75	100	30	40	3
	<b>III</b>	15BCS24A	<b>Allied – 2:</b> Discrete Mathematics	6	25	75	100	30	40	5
	<b>III</b>	15BCS25P	<b>Practical 2:</b> COBOL Programming Lab	5	40	60	100	24	40	2
	<b>IV</b>	15ENV2GE	Value Education – Gandhian Thoughts	2	25	75	100	30	40	2
				<b>30</b>			<b>600</b>			<b>18</b>
<b>III</b>	<b>III</b>	15BCS31C	<b>Core – 3:</b> Computer System Architecture	5	25	75	100	30	40	3
	<b>III</b>	15BCS32C	<b>Core – 4:</b> Data Structures	5	25	75	100	30	40	3
	<b>III</b>	15BCS33C	<b>Core – 5:</b> C Programming	5	25	75	100	30	40	3
	<b>III</b>	15BCS34A	<b>Allied – 3:</b> Operations Research	6	25	75	100	30	40	5
	<b>III</b>	15BCS35P	<b>Practical 3:</b> C Programming Lab	5	40	60	100	24	40	2
	<b>IV</b>	15BCS36S	<b>Skill Based Subject – I:</b> Microprocessor & Assembly Language Programming	4	25	75	100	30	40	3
				<b>30</b>			<b>600</b>			<b>19</b>
<b>IV</b>	<b>III</b>	15BCS41C	<b>Core – 6:</b> Software Engineering	5	25	75	100	30	40	5
	<b>III</b>	15BCS42C	<b>Core – 7:</b> Database Management System	5	25	75	100	30	40	5
	<b>III</b>	15BCS43C	<b>Core – 8:</b> Object Oriented Programming with C++	5	25	75	100	30	40	5
	<b>III</b>	15BCS44A	<b>Allied – 4:</b> Business Accounting	6	25	75	100	30	40	5
	<b>III</b>	15BCS45P	<b>Practical 4:</b> C++ Programming Lab	5	40	60	100	24	40	2
	<b>IV</b>	15BCS46S	<b>Skill Based Subject – II:</b> Principles of System Software	4	25	75	100	30	40	3
	<b>V</b>	15EXA4GE	<b>Extension Activities:</b> NCC/NSS/P. Ed/YRC	--			---			1
				<b>30</b>			<b>600</b>			<b>26</b>
	<b>III</b>	15BCS51C	<b>Core – 9:</b> Operating Systems	6	25	75	100	30	40	5

<b>V</b>	<b>III</b>	15BCS52C	<b>Core – 10:</b> Java Programming	6	25	75	100	30	40	5
	<b>III</b>	15BCS53C	<b>Core – 11:</b> Computer Networks	6	25	75	100	30	40	5
	<b>III</b>	15BCS54P	<b>Practical 5:</b> Java Programming Lab	5	40	60	100	24	40	5
	<b>IV</b>	15BCS55S	<b>Skill Based Subject – III:</b> Computer Graphics	4	25	75	100	30	40	3
	<b>IV</b>	15BCS5EL	<b>Non-Major Elective Paper – I:</b> Information Technology – 1(Fundamentals of Computers)	3	25	75	100	30	40	2
				<b>30</b>			<b>600</b>			<b>25</b>
<b>VI</b>	<b>III</b>	15BCS61C	<b>Core – 12:</b> Visual Basic Programming	6	25	75	100	30	40	5
	<b>III</b>	15BCS62C	<b>Core – 13:</b> Artificial Intelligence and Expert Systems	5	25	75	100	30	40	4
	<b>III</b>	15BCS63P	<b>Practical 6:</b> Visual Basic Programming Lab	5	40	60	100	24	40	5
	<b>III</b>	15BCS64V	<b>Project &amp; Viva – Voce</b>	7	20	80	100	32	40	15
	<b>IV</b>	15BCS65S	<b>Skill Based Subject – IV:</b> Web Programming	4	25	75	100	30	40	3
	<b>IV</b>	15BCS6EL	<b>Non-Major Elective Paper – II:</b> Information Technology – 2 (Office Automation)	3	25	75	100	30	40	2
			<b>30</b>			<b>600</b>			<b>34</b>	
		<b>Total / Credits</b>				<b>3600</b>			<b>140</b>	

# These papers are offered by Department of Computer Science to other Major students of the college

\* Exam: 3 Hrs

## SEMESTER – I

### Core-1: DIGITAL COMPUTER FUNDAMENTALS

#### UNIT – I

**Number Systems:** Decimal, Binary, Octal, Hexadecimal – conversion from one to another – Binary Addition, Subtraction, Multiplication and Division – Codes – BCD – Weighted – Excess-3 – Gray – Error Detection Codes.

#### UNIT – II

Basic Logic Gates – Boolean Laws and Theorems – Sum of Products – Product of Sums – Karnaugh Map – Simplification methods – Don't Care Conditions.

#### UNIT – III

**Data Processing Circuits:** Multiplexers – Demultiplexers – Decoders – Encoders Arithmetic building blocks: Half Adder, Full Adder, Subtractor, Adder – TTL Circuits – CMOS Circuits.

#### UNIT – IV

**Flip Flops:** RS, Clocked RS, D, - Edge triggered D, JK, JK Master/Slave Flip Flops Clocks and Timers: Counters – Asynchronous Counters – Synchronous Counters, MOD-3, MOD-5, Shift Counters.

#### UNIT – V

D/A And A/D Conversion: Variables – Resistors Network Binary Ladder – D/A Converter – D/A Accuracy and Resolution – A/D Converter (Simulations Conversion) – A/D Converter (Counter Method) – Continuous A/D Conversion – A/D Techniques – Dual – Slope A/D Conversion

#### TEXT BOOK

1. “Digital Principles and Applications” – Albert Paul Malvino, Donald, P. Leach, McGraw Hill, 2002

#### REFERENCE BOOK

1. “Digital Computer Fundamentals” – Bartee, Tata McGraw Hill, 1996
2. Digital Logic & Computer Design, Morris Mano, PHI, 2001

## SEMESTER – I

### Allied-1: STATISTICS AND NUMERICAL METHODS

#### UNIT I

**Measures of Central Tendency:** Mean, Median and Mode - Relationship among Mean, Median and Mode - Uses, Merits and Demerits - Measures of Dispersion: Range - Quartile Deviation - Mean Deviation - Standard Deviation and Coefficient of Variation.

#### UNIT II

**Skewness:** Meaning - Bowley's and Karl Pearson's Measures of Skewness. Correlation (Two Variable Linear Case): Correlation - Meaning - Scatter Diagram - Types of Correlation - Karl Pearson Correlation Coefficient – Concurrent Deviation Method - Rank Correlation.

#### UNIT III

Linear Regression - Regression Equations for Two Variables - Regression Coefficients - Properties - Simple Problems.

**Curve Fitting:** Linear, Parabola, Exponential and Power Curves.

#### UNIT IV

Numerical Methods - System of Simultaneous Equations: Gauss Elimination-Gauss Jordan, Gauss Siedal Methods with Algorithms - Interpolation : Newton's Forward and Backward Interpolation Formula - Lagrange's Interpolation with Algorithms. (No Derivation, Simple Problems Only).

#### UNIT V

**Numerical Differentiation:** Forward Difference - Backward Difference - Stirling and Bessel's Formula. Numerical Integration: Trapezoidal Rule and Simpson Rule with Algorithms - Solving Ordinary Differential Equations: Taylor's series and Runge-Kutta Method for Numerical Solution of Ordinary Differential Equations with Algorithms.

(No derivation, Simple problems only)

#### Text Books:

1. Fundamental of Mathematical Statistics: S.C. Gupta & V.K. Kapoor, Sultan Chand & Sons, New Delhi.
2. Numerical Methods: P.Kandasamy, K. Thilagavathy, K. Gunavathi, S. Chand & Company Ltd, New Delhi.
3. Numerical Methods in Science and Engineering: M.K.Venkatraman, National Publishing Company, New Delhi.

#### Reference Books:

1. Computer Oriented Numerical Methods - V.Rajaraman
2. Business Statistics – B. R. Vittal, Margham Publications, Chennai.

## SEMESTER – I

### Practical 1: OFFICE AUTOMATION LAB

#### MS-POWER POINT

1. Prepare an Organization Chart for a college environment in Power point.
2. Perform frame movement by inserting clip arts to illustrate running of a car automatically.

#### MS-EXCEL

1. Built a worksheet to perform correlation and regression coefficients using formulae and check the answer with built-in.
2. Worksheet preparation for Electricity bill preparation.
3. Draw graphs to illustrate class performance.

#### MS-WORD

6. Illustrate the mail merge concept to apply for a suitable job for atleast 5 companies
7. Using MS-Word perform the following.
  - a) Change the font size to 20.
  - b) Change the font type to Garamond.
  - c) Align the **TEXT** to left, right, justify, and center.
  - d) Underline the **TEXT**.
  - e) Table manipulation.

#### MS-ACCESS

8. Perform sorting on name, place, and pin code of students database and list them in the sorted order.
9. Using Queries retrieve information from Sales Database which contains trans-no, date, prod-id, prod-name, qty, unit-price and region. List out records region-wise, date-wise, product-wise.
10. Create mailing labels for Employee database.

## SEMESTER - II

### Core-2: COBOL PROGRAMMING

#### UNIT – I

**COBOL:** Format of COBOL programs - Program structure - Character set - COBOL Reserved and Keywords - Data names and Identifiers, Literals, Figurative constants - IDENTIFICATION DIVISION - ENVIRONMENT DIVISION - Input Output section.

#### UNIT – II

DATA DIVISION - File Section – Working-Storage Section - Picture clauses - both Edited and Non Edited - Structure of a PROCEDURE DIVISION. Arithmetic Verbs - MOVE verb - Data movement, Sequence control, Input-Output and Conditional verbs - REDEFINE clause - RENAME clause - CORRESPONDING options - IF statement.

#### UNIT - III

PERFORM statements - Table handling - OCCURS clause - Multi dimensional tables - PERFORM verb and Table handling - Indexed tables and Indexed names - SET verb - SEARCH verb - Sorting a Table.

#### UNIT – IV

Sequential files - File characteristics - File control entries - Fixed length records - Variable length records - Statements for Sequential files - Examples of Sequential File processing - SORT and MERGE verbs - Random files - Keys and their importance - Invalid key clause - Example programs using Random files - Relative and Indexed Sequential files.

#### UNIT – V

Character handling - INSPECT verb - STRING and UNSTRING verbs - COBOL Subroutines - Structure of a subroutine - Calling Subroutine - Examples using Subroutines .

#### TEXT BOOKS

1. M. K. Roy, D. Ghose Dastidar, COBOL Programming, Second Edition, Tata McGraw Hill, 2003.

## SEMESTER – II

### Allied-2: DISCRETE MATHEMATICS

#### UNIT I

**Mathematical Logic:** Propositions and Logical Operators - Truth Table –Tautology – Contradiction - Equivalence and Implication - Normal Forms (DNF, CNF, PDNF and PCNF). (Chapter I: Sections: 1.1 – 1.3).

#### UNIT II

**Inference Theory:** Inference Theory for Statement Calculus – Predicates – Quantifiers – Variables -Free and Bound Variables - Inference Theory for Predicate Calculus. (Chapter II: Sections: 1.4 - 1.6).

#### UNIT III

**Basic Set Theory:** Basic Definitions - Venn Diagrams and Set Operations - Laws of Set Theory - Principle of Inclusion and Exclusion – Relations - Properties of Relations - Matrices of Relations – Functions - Injective, Surjective and Bijective Functions. (Chapter III: Sections: 2.1, 2.3 and 2.4).

#### UNIT IV

**Formal Languages and Automata:** Languages - Operations on Languages - Regular Expressions and Regular Languages – Grammar - Types of Grammars - Finite State Machine - Finite State Automata. (Chapter IV: Section: 3.3 and Chapter VI: Sections: 6.1 and 6.2).

#### UNIT V

**Graph Theory:** Basic Terminology - Types of Graphs - Paths, Cycle and Connectivity - Representation of Graphs in Computer memory – Trees - Properties of Trees - Binary Trees - Traversing Binary Trees - Computer Representation of General Trees. (Chapter V: Sections: 5.1 and 5.2).

#### TEXT BOOK

1. Discrete Mathematical Structures with Applications to Computer Science, J.P. Tremblay R.Manohar, Mc Graw Hill International Edition, 1997. (For Unit I, Unit II, Units III and Unit V)
2. Discrete Mathematics, Dr.M.K.Venkataraman, Dr.N.Sridharan, N.Chandarsekaran, The National Publishing Company, Chennai, 2002. (For Unit IV)

#### REFERENCE BOOKS:

Discrete Mathematics, J.K.Sharma, Macmillan India Limited, Second Edition, 2005.

## SEMESTER - II

### Practical 2: COBOL PROGRAMMING LAB

1. Accept from the terminal the age and name of a student and if he is over 21, display that he is eligible to vote; else display the number of years he must wait before he can vote. Also check whether the last ACCEPT was terminated by pressing F2 key or not, If F2 key was used as the terminating key, transfer control to the paragraph known as FUNC-TWO.

2. The Balance B in an account with a principal P and simple interest of r% after n years is given by the formula.

$$B = P(1 + NR/100).$$

Given P in rupees calculate and display B to the nearest rupee. Assume that n and r are integers obtained through ACCEPT statement. (One program may use arithmetic verbs and the other may use compute statement.

3. The format of the input record is as follows

Columns	Fields
1 - 10	Part number
11 - 50	Description of item
51 - 56	Stock quantity(XXXX.XX)
57 - 62	Stock value(XXXX.XX)

i. Print the total number of records.

ii. Print the heading in the format shown below.

5 BLANKS Part NO 5 BLANKS Description 5 BLANKS Stock quantity  
5 BLANKS stock value

4. A File contains the following records about a class.

Fields	Columns
Serial number	1 - 4
Roll number	5 -10
Name	11-30
Age	31-32
Sex	33
Year in college	34

Select records with the following characteristics and write them in two files.

FILE-1 Records of all males over 18 years of age, who are in the third year in the college.

FILE-2 Records of all females under 19 years of age, in the fourth year of the college.

Use condition names for sex and year in college.

5. An electricity company supplies electricity to four types of customers coded 1,



2, 3 & 4. The rate schedule for customers is shown in one table as

Customer code	1	2	2	3	3	4
Consumption	all	below 1000	1000 &above	below 5000	5000 &above	all
Rate/Unit	0.50	0.40	0.50	0.50	0.50	0.30

The customer record is

Col.	1-5	customer number
Col	6-60	name and address
Col	60-67	consumption in units
Col	68	consumer code.

Read a customer record and print a bill using GOTO DEPENDING ON statement.

6. There is list containing students information along with their grades for a given course. A typical input is given below

Serial no.	5 col.
Roll no	6 col.
Name	25 col.
Grade	1 col.

The grade can be one of the letters A,B,C,D,E,F. Test the class condition for any three fields among the above and count the number of students receiving A grade or F grade.

7. Display the following menu

1. Triangle
2. Square
3. Rectangle

Depending on the choice, display the shape filled with asterisks (\*). Assume suitable size for these shapes.

8. The input record layout is given below.

Positions	Fields
1 - 8	Account- Number (alphanumeric)
9 - 15	Not used
16 - 17	Trans-code(numeric integer)]
18 -60	Not used

Write a program that will sort the file into the trans-code into the account-number order.

9. A company maintains inventory data on tape. The master file is sorted on part-no and contains the following type of data for each item held in inventory.

Field	Size
Part-no	9(5)
Name	X(5)
Quantity	9(5)

There are two types of transactions receipts and issues. Each transactions is recorded as below

Field	Size
Part-no	9(5)
Transaction code(1=receipts,2=issue)	9
Quantity	9(5)

When the transaction code is 1, the qty is added. If the code is 2, the qty is subtracted.  
Update the master file.

10. Print the words of a given sentence one per line. Display the first letter of all the words together as a single word at the end. The words in the sentence may be separated by one or more spaces.

11. A bank has the following policy on deposits-

On deposits of Rs. 5,000 or more and for years 3 or more the interest is 10%. On the deposits of Rs. 5000 or more and years less than 3, the interest is 8%. On deposits less than Rs. 5000, regardless of the period the interest is 7%. Given below is the input record

Depositor no.	col. 1-5
Depositor name	col. 6-31
Amount deposited	col. 32-37
Period of deposit	col. 38-39 (number of years)

Output the record with the same information along with interest on deposit and the other net amount.

12. The telephone department maintains the following information regarding the subscribers in a file as follows

Columns	Fields
1 - 5	Subscriber number
6 - 25	Subscriber name
30 - 41	Address
42 - 48	Phone-no.

The above information about new subscribers are stored in a new file. Assuming they are already sorted in both the files, merge them and create a new file.

13. The payroll data of a company has the following information

COLUMNS	FIELDS	SIZE
1 - 9	Identity number	X(3)9(6)
10 - 34	Employee name	X(25)
35 - 38	Hourly pay rate	99V99
39 - 80	Miscellaneous information	

The company decides to increase the hourly pay rate of the employees as below

- (i) Those getting up to Rs. 5 by 25%
- (ii) Those getting above Rs. 5 and up to Rs. 8 by 20%
- (iii) Those getting above Rs. 8 and up to Rs. 12 by 15%
- (iv) Those getting above Rs. 12 by 10%

Change the hourly rate field in the payroll file and write the same. Headings are to be written.

## SEMESTER – III

### Core-3: COMPUTER SYSTEM ARCHITECTURE

#### UNIT – I

**Data Representation:** Fixed point representation – Floating point representation – Alphanumeric code.

**Register Transfer and Micro operation:** Register Transfer Language – Register Transfer – Arithmetic Micro operation – Logic Micro operation – Shift Micro operation – Arithmetic Logic Shift Unit.

#### UNIT – II

**Basic Computer Organization and Design:** Instruction Codes – Timing and Control – Computer Register – Instruction Cycle – Input-Output and Interrupt.

**Micro-Programmed Control:** Control Memory – Address Sequencing – Design of Control Unit.

#### UNIT – III

**Central Processing Unit:** General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Programmed Control – Reduced Instruction Set Computer – CISC.

#### UNIT – IV

**Computer Arithmetic:** Addition and Subtraction – Multiplication Algorithm – Division Algorithm – Floating-point Arithmetic operation – Decimal Arithmetic Operations.

**Input Output Organization:** Peripheral Devices – Input Output Interface – Asynchronous Data Transfer – Modes of Transfer – Direct Memory Access – Input Output Processor (IOP).

#### UNIT – V

**Memory Organization:** Memory Hierarchy – Main memory – Auxiliary memory – Associative memory – Cache memory – Virtual memory.

**Multiprocessors:** Characteristics of Multiprocessors – interconnection Structures.

#### TEXT BOOKS

1. Computer System Architecture, M. Morris Mano , Third Edition, PHI, 2007.

#### REFERENCE BOOKS

1. Computer Architecture and Organization, Hayes. J. P., McGraw Hill, 2009.

## SEMESTER – III

### Core-4: DATA STRUCTURES

#### UNIT – I

Introduction – Overview – How to create programs and analyse them – Arrays – Structures – Ordered Lists – Representation of arrays – Simple Applications.

#### UNIT – II

**STACKS:** primitive operations - sequential implementation - Applications: Subroutine handling - Recursion – Expression Processing, Parentheses matching.

**QUEUES:** Primitive operations - sequential implementation - Priority Queues - Dequeues – Applications

#### UNIT – III

**Linked Lists** – Single linked lists – Linked stacks and queues – The Storage pool – Applications – Polynomial addition, Sparse matrices.

Double Linked lists – Dynamic storage management – Garbage collection and compaction.

#### UNIT – IV

**TREES:** Terminologies - implementation - **BINARY TREE:** Properties - sequential and linked representation - common binary tree operations - traversals - Expression trees - Infix, Postfix and Prefix expressions - Threaded trees - Tournament trees - Heaps, Max heap, Min heap - Applications: Huffman codes.

#### UNIT – V

**Files** – Queries and sequential organizations – Index Techniques. File Organizations – Sequential, Random, Linked Organizations – Inverted Files – Cellular Partitions.

#### TEXT BOOKS

1. Ellis Horowitz & Sartaj Sahani “Fundamentals of data Structure”, Galgotia Books source, 2006.

#### REFERENCE BOOKS

1. Aaron M Tanenbaum, Moshe J Augenstein and Yedidyah Langsam, "Data structures using C and C++", Pearson Education, New Delhi, 2009.
2. Ashok N Kamthane, “Programming and Data Structures”, Pearson Education, 2004.

## SEMESTER – III

### Core-5: C PROGRAMMING

#### UNIT – I

**Over view of C** - Importance of C - Sample C programs - Basic structure of C programs -Executing a C program. **Constants, Variables, and Data Types** - Character set - C tokens - Keywords and identifiers – Constants – Variables - Data types. **Operators and Expressions** – Arithmetic Operators - Relational operators - Logical operators - Assignment operators - Increment and decrement operators - Conditional operator -Bitwise operators - Special operators - Type conversion in expressions -Operator precedence and associativity

#### UNIT – II

**Managing Input and Output Operators** - Reading a character - Writing a character -Formatted input - formatted output. **Decision Making and Branching** - Decision making with **IF** statement - Simple **IF** statement - The **IF ELSE** statement - -The switch statement - The?: Operator -The **GOTO** statement. **Decision Making and Looping** - The **WHILE** statement - The **DO** statement - The **FOR** statement

#### UNIT – III

**Arrays** – Introduction - One dimensional arrays - Two dimensional arrays - Multidimensional arrays. **Handling of Character Strings** -Declaring and initializing string variables - Reading strings from terminal - Writing strings to screen - Arithmetic operations on characters - Putting strings together -Comparison of two strings – String - Handling functions.

#### UNIT – IV

**User-Defined Functions** – Introduction - Need for user-defined function - The form of C functions - Return values and their types - Calling a function - Category of functions – Recursion -Functions with arrays - The scope and lifetime of variables in functions. **Structures and Unions** - Structure definition - Giving values to members - Structure initialization -Comparison of structure variables - Arrays of structure variables - Arrays within structures - Structures within structures - Structures and functions – Unions - Size of structures - Bit fields.

#### UNIT – V

**Pointers** - Understanding pointers - Accessing the address of a variables - Declaring and initializing pointers - Accessing a variable through its pointer - Pointer expressions -Pointers and arrays - Pointers and character strings - Pointers and functions - Pointers and structures.

**File Management in C** - Defining and opening a file -Closing a file - Input/Output operations on files - Error handling during **I/O** operations -Random access to files - Command line arguments.

#### TEXT BOOKS

1. E. Balagurusamy, ” Programming in ANSI C”, TMH Publishers, 2012

## SEMESTER - III

### Allied-3: OPERATIONS RESEARCH

#### UNIT I

**Linear Programming Problem:** Formulation of L.P.P – Graphical solutions of L.P.P – Canonical & Standard forms of LPP – Simplex Method. Duality in L.P.P – Formulation of Duality. Duality and Simplex method – Dual Simplex Method  
(Chapter 2: Sections 2:1 -2:4; Chapter 3: Sections 3:1 - 3:5; Chapter 4: Sections 4:1 - 4:3; Chapter 5: Sections 5:1 - 5:4, 5:7, 5:9).

#### UNIT II

**Game Theory:** Two person zero sum game – The Maximin – Minimax principle – Problems. Solution of 2 x 2 rectangular Games – Domination Property – (2 x n) and (m x 2) graphical method – Problems – Dominance Property.  
(Chapter 17: Sections 17:1 - 17:7).

#### UNIT III

**The Transportation Problems:** Basic feasible solution by L.C.M – NWC- VAM- Optimum solutions (MODI Method) – Unbalanced Transportation problems. The Assignment Problems – Assignment algorithm – Optimum solutions (Hungarian Method) – Unbalanced Assignment Problems. (Chapter 10: Sections 10:1 - 10:13; Chapter 11: Sections 11:1 - 11:4).

#### UNIT IV

**Inventory control:** Types of inventories – Inventory costs – EOQ Problem with no shortages – Production problem with no shortages – EOQ with shortages – Production problem with shortages – EOQ with price breaks. (Chapter 19: Sections 19:1 - 19:12).

#### UNIT V

Network scheduling by PERT / CPM – Introduction – Network and basic components – Rules of Network construction – Time calculation in Networks – CPM. PERT – PERT calculations – Problems. (Chapter 25: Sections 25:1 - 25:8, 30:1 -30:3).

#### TEXT BOOKS:

1. Operations Research, Kandiswarup, P. K. Gupta, Man Mohan, S. Chand & Sons Education Publications, New Delhi, Fourteenth Revised Edition, Reprint 2009.
2. Problems in Operations Research, P. K. Gupta, Man Mohan, S. Chand and Sons Education Publications, Eleventh Edition, Reprint 2007.

#### REFERENCE BOOKS:

1. Operations Research - An Introduction, Hamdy A.Taha, Eight Edition, Pearson Education, Reprint 2009.
2. Problems in Operations Research, P.K Gupta and D.S. Hira S.Chand and Company Limited, Third Edition, Reprint 2000.
3. Operations Research Theory and Applications, J.K.Sharma, Macmillan India limited Second Edition, Reprint 2002.

**SEMESTER – III**  
**Practical 3: C PROGRAMMING LAB**

**LIST OF PRACTICAL PROBLEMS FOR C PROGRAMMING**

1. Write a program to find the sum, average, standard deviation for a given set of numbers.
2. Write a program to find the number of palindromes in a given sentence.
3. Write a program to generate ‘n’ prime numbers.
4. Arrange a set of numbers in **ASCENDING ORDER** using **QUICK SORT**.
5. Arrange a set of numbers in **DESCENDING ORDER** using **HEAP SORT**.
6. Implement **LINEAR** and **BINARY SEARCH** to find a particular name in a list of names
7. Write function for following **STACK** operations.  
i. **PUSH**      ii. **POP**      iii. **LIST STACK**
8. Write a program to print the student’s Mark sheet assuming rno, name, and marks in five subjects in a structure. Create an array of structures and print the mark sheet in the university pattern.
9. Write a menu driven program to implement **QUEUE** to perform
  - a. Insertion
  - b. Deletion
  - c. Modification and
  - d. Listing of elements using pointers.
10. Write a program for Linked List representation of Employee record and do the following operations using pointers.
  - a. To add a new record
  - b. To delete an existing record
  - c. To print the information about an employee
  - d. Finding the number of employee in the structure
11. Write a program to perform all manipulations like insertion, deletion and modification in files.
12. Write a program which takes a file as command line argument and copy it into another file. At the end of the second file write i)Number of Characters ii) Number of Words and iii) Number of Lines.

**SEMESTER – III**  
**Skill Based Subject-I: MICRO PROCESSOR & ASSEMBLY LANGUAGE**  
**PROGRAMMING**

**UNIT – I**

Introduction to Microprocessors – Evolution of Microprocessors- Buses -Microprocessor Architecture: Intel 8085 – ALU - Timing and control unit – Registers - Pin configuration - Instruction cycle: Fetch and Execute operation - Machine cycle and state.

**UNIT – II**

Instruction set of INTEL 8085: Introduction – Instruction and Data formats - Addressing Modes - Status Flags - Intel 8085 Instructions: Data transfer group – Arithmetic group- Logical group - Branch group - Stack, I/O machine control group - Assembly language: stacks – subroutines – MACRO.

**UNIT – III**

Assembly language programming - Addition of two 8-bit numbers - 8-bit subtraction -Decimal addition of two 8-bit numbers - Addition of two 16-bit numbers - 8-bit decimal subtraction - finding square from look-up table - Finding largest number in a data array - Arrange a data array in ascending and descending order - Sum of series of 8-bit numbers - 8-bit multiplication - 8-bit division.

**UNIT – IV**

Peripheral devices and their interfacing: Address space partitioning - Memory and I/O interfacing - Interrupts of Intel 8085 - I/O ports: Programmable Peripheral interface - Architecture of Intel 8255.

**UNIT –V**

Programmable DMA controller - Programmable interrupt controller 8259 - Programmable communication interface 8251 - Programmable counter/interval timer 8253.

**TEXT BOOKS**

1. B.RAM, “Fundamentals of Microprocessors and Microcontrollers,” Dhanpat Rai Publications, 7<sup>th</sup> Edition, 2010.

**REFERENCE BOOKS**

1. Ramesh Gaonkar, “Microprocessor Architecture, Programming and Applications with the 8085”, Penram International publishing (India) PVT. LTD., 6<sup>th</sup> Edition, 2013.
2. Aditya P Mathur, ”Introduction to Microprocessors”, McGraw Hill Education (India) Private Limited, 3<sup>rd</sup> Edition, 2001.



## SEMESTER – IV

### Core-6: SOFTWARE ENGINEERING

#### UNIT – I

**INTRODUCTION:** System - System Development - types of systems – people involved in the systems development – need for software Engineering - objectives & benefits of Software Engineering - Factors that influence Quality & Productivity – Quality attributes of a software product.

**THE SOFTWARE PROCESS:** A generic view of process - Process Framework – Process Patterns – Process Assessment.- Process Models - The Waterfall Model – Incremental Process Model – Evolutionary Process model – Specialized Process Models & The Unified Process.

#### UNIT – II

**SOFTWARE PLANNING:** Software Project Estimation - different techniques of project cost estimation Decomposition technique - COCOMO & PUTNAM models.

**SOFTWARE ENGINEERING PRACTICES** – Core Principles – Communication Practices – Planning Practices – Modeling Practices –Construction Practices – Deployment

#### UNIT – III

**REQUIREMENTS ENGINEERING:** Requirements Engineering tasks – Initiating Requirements Engineering Process – Eliciting Requirements – Negotiating Requirements – Validating Requirements.

**BUILDING THE ANALYSIS MODEL:** Requirements Analysis – Analysis Modeling approaches – Data Modeling concepts: Data Dictionary – ERD, Flow Oriented Modeling: Data Flow Diagram – Creating a Behavioral Model – State Transition Diagram.

#### UNIT – IV

**DESIGN ENGINEERING:** Design Process & Design Quality – Design Concepts – The Design Model: Data Design Elements – Architectural Design Elements – Interface Design Elements – Component level Design Elements – Deployment level Design Elements. Design Tools: HIPO diagram - Structure Chart - Decision Tree - Decision Table - Structured Flowchart.

#### UNIT – V

**SOFTWARE TESTING & DEBUGGING:** Testing Strategies – Testing Tactics – Testing Methodologies and Debugging Methods – study of automated Testing tools

#### TEXT BOOKS

1. Pressman R S, “Software Engineering - A Practitioner’s Approach”, Tata McGraw Hill, New Delhi, 2010.
2. Pankaj Jalote, “Integrated Approach to Software Engineering”, Springer, New York, 2010.

#### REFERENCE BOOKS

1. Ian Sommerville, “Software Engineering”, 6<sup>th</sup> Edition, Pearson education Publ., 2001.

## **SEMESTER – IV**

### **Core-7: DATABASE MANAGEMENT SYSTEM**

#### **UNIT I:**

Introduction : Purpose of Database Systems – View of Data – Data Models – Database Languages – Transaction Management – Storage Management, Database Administrator – Database Users – Overall System Structure.

Entity Relationship Model : Basic Concepts – Keys – Entity Relationship Diagram – Weak Entity Sets, Extended E-R Features – Specialization , Generalization.

#### **UNIT II:**

Relational Model: Structure of Relational Databases – Relational Algebra – Views.

SQL : Background – Basic Structure – Set Operations – Aggregate Functions – Null Values - Nested Subqueries – Derived Relations – Views – Modification of the Database – Joined Relations – Data Definition Language – Embedded SQL – Other SQL Features.

#### **UNIT III :**

Integrity constraints: Domain Constraints – Referential Integrity – Assertions – Triggers – Functional Dependencies.

Relational Database Design : Pitfalls – Decomposition – Normalization using Functional Dependencies . Object Oriented Databases : New Database Applications – Object Oriented Data Model.

#### **UNIT IV :**

Database System Architecture : Centralized Systems – Client /Server Systems – Parallel Systems – Distributed Systems – Network Types.

#### **UNIT V :**

New Applications : Decision Support Systems – Data Analysis – Data Mining – Data Warehousing – Spatial and Geographic Databases – Multimedia Databases – Mobility and Personal Databases – Information Retrieval Systems – Distributed Information Systems.

#### **TEXT BOOK :**

“Database System Concepts “ by Abraham Silberschatz, Henry F. Korth, S.Sudarshan , 3<sup>rd</sup> ed, 1997.

#### **REFERENCE BOOKS :**

1. “Database Management Systems” by Alexis Leon and Mathews Leon.
2. “Database Management Systems “ by Elmasri and Navathe.

## SEMESTER – IV

### Core-8: OBJECT ORIENTED PROGRAMMING WITH C++

#### UNIT – I

**Principles of Object Oriented Programming:** Software Crisis - Software Evolution - Procedure Oriented Programming - Object Oriented Programming Paradigm - Basic concepts and benefits of OOP - Object Oriented Language - Application of OOP - Structure of C++ - Applications of C++ - Tokens, Expressions and Control Structures - Operators in C++ - Manipulators.

#### UNIT – II

**Functions in C++:** Function Prototyping - Call by reference - Return by reference - Inline functions - Default, const arguments - Function Overloading - Classes and Objects - Member functions - Nesting of member functions - Private member functions - Memory Allocation for Objects - Static Data Members - Static Member functions - Array of Objects - Objects as function arguments - Returning objects - friend functions

#### UNIT – III

**Constructors:** Parameterized Constructors - Multiple Constructors in a class - Constructors with default arguments - Dynamic initialization of objects - Copy and Dynamic Constructors - Destructors - Operator Overloading - Overloading unary and binary operators

#### UNIT – IV

**Inheritance:** Defining derived classes - Single Inheritance - Making a private member inheritable - Multiple inheritance - Hierarchical inheritance - Hybrid inheritance - Virtual base classes - Abstract classes - Constructors in derived classes - Member classes - Nesting of classes.

#### UNIT – V

**Streams:** Pointer to object – Virtual functions - Character I/O - Object I/O - I/O with multiple objects - File pointers - Disk I/O with member functions - Exception handling - Templates - Overloading the extraction and the insertion operators.

#### TEXT BOOKS

1. Robert Lafore, “Object Oriented Programming in C++”, Third edition, Galgotia Publications Pvt. Ltd, 2000.

**SEMESTER – IV**  
**Allied-4: BUSINESS ACCOUNTING**

**UNIT – I**

Accounting – definition and functions – accounting conventions concepts – systems of accounting – rules for double entry system of books keeping – preparation of journal and ledger accounting.

**UNIT – II**

Subsidiary books – purchase books – sales books – purchase returns books - sales return books – cash books.

**UNIT – III**

Preparation of trial balance (**except errors**) – final accounts – manufacturing, trading, profit and loss accounts and balance sheet with simple adjustments.

**UNIT – IV**

Depreciation – methods of depreciation – straight line method and diminishing balance method. Cost accounting– elements of costing – type of costing – preparation of sample cost sheets.

**UNIT – V**

Pricing of material issued – FIFO-LIFO, Simple and weighted– average methods. Labour cost accounting – calculation of wages and over time payable to workers – individual bonus plans – Halsay system and Rowan system.

**NOTE:** 60% of the question should be related to problems and 40% relating to theory question.

**TEXT BOOKS**

1. T.S.Grewal “Double Entry Books Keeping”, Sultan Chand & Sons Publ.
2. S.P.Jain & K.L.Narang, “Cost Accounting Principles and Practice”, 13<sup>th</sup> Edition, Kalyani Publ.

## SEMESTER – IV

### Practical 4: C++ PROGRAMMING LAB

#### OBJECTS and CLASSES

1. Create a Class to implement the data structure STACK. Write a Constructor to initialize the TOP of the Stack to 0. Write a member function PUSH() to insert an element and a member function POP() to delete an element. Check for overflow and underflow conditions.
2. Create a class ARITH which consists of a FLOAT and an INTEGER variable. Write member functions ADD(), SUB(), MUL(), DIV(), MOD() to perform addition, subtraction, multiplication, division and modulus respectively. Write member functions to get and display values.

#### OPERATOR OVERLOADING

3. Create a class MAT has a 2-D matrix and R & C represents the rows and columns of the matrix. Overload the operators +, -, \*, to add, subtract and multiply two matrices. Write member functions to get and display MAT object values.
4. Create a class STRING. Write member functions to initialize, get and display strings. Overload the operator + to concatenate two strings, == to compare 2 strings and a member function to find the length of the string.

#### INHERITANCE

5. Create a class which consist of EMPLOYEE detail like eno, ename, dept, basic salary, grade. Write member functions to get and display them. Derive a class PAY from the above class and write a member function to calculate da, hra, pf depending on the grade and display the Payslip in a neat format using console I/O.
6. Create a class SHAPE which consist of two VIRTUAL FUNCTIONS Cal\_Area() and Cal\_Perimeter() to calculate Area and Perimeter of various figures. Derive three classes SQUARE, RECTANGLE AND TRIANGLE from the class SHAPE and calculate Area and Perimeter of each class separately and display the result.
7. Create two classes which consist of two private variables, one Integer and one Float variable in each class. Write member functions to get and display them. Write a FRIEND function common to both classes which takes the object of the above two classes as arguments and the Integer and Float values of both the objects separately and display the result.

### **CONSOLE I/O**

8. Write a user-defined function `USERFUN()` which has the formatting commands like `setw ()` , `showpoint` , `showpos` , `precision ()`. Write a program which prints an multiplication table and uses `USERFUN()` for formatting.

### **FILES**

9. Write a program to perform insertion, deletion and updation using files.
10. Write a program, which takes a file as argument and copies into another files with line numbers using Command Line Arguments.

## SEMESTER – IV

### Skill Based Subject -II: PRINCIPLES OF SYSTEM SOFTWARE

#### UNIT-I

**LANGUAGE PROCESSORS:** Language Processing Activities – Fundamentals of Language Processing – Fundamentals of Language Specification – Language Processor Development Tools.

#### UNIT-II

**ASSEMBLERS AND MACRO :** Elements of Assembly Language Programming – Overview of Assembly Process - Design of a Two – Pass Assembler - Macro Definition and Call – Macro Expansion – Nested Macro Calls.

#### UNIT-III

**COMPILER I :** Scanning: Finite State Automate – Regular Expressions – Building DFA – Performing Semantic Action – Writing a Scanner – Parsing: Parse Tree and Abstract Syntax Trees – Top Down Parsing – Bottom-Up Parsing.

#### UNIT-IV

**COMPILER II AND INTERPRETERS:** Aspects of Compilation –Memory Allocation - Compilation of Expressions-Compilation of Control Structure-Code Optimization - Interpreters.

#### UNIT- V

**LINKERS:** Relocation and Linking Concepts – Design of a Linker – Self-Relocating Programs – Linking for Overlays - Loader.

#### TEXT BOOK

D.M. Dhamdhare, “System Programming And Operating Systems”, New Delhi: Tata McGraw-Hill Publishing Company Limited, 1993.

<b>Unit I</b>	:	Ch.1.1-1.5.
<b>Unit II</b>	:	Ch. 4.1- 4.4 & 5.1-5.3
<b>Unit III</b>	:	Ch.3.1-3.2
<b>Unit IV</b>	:	Ch.6.1-6.6.
<b>Unit V</b>	:	Ch.7.1-7.3 & 7.5 -7.6

#### REFERENCE BOOK

John J. Donovan, “Introduction to System Software”, New Delhi, Tata McGraw-Hill Publishing Company Limited, 1993.

## SEMESTER – V

### Core-9: OPERATING SYSTEMS

#### UNIT-I

**INTRODUCTION:** Abstract view of an operating system - Operating Systems Objectives and Functions – Evolution of Operating Systems - Dual-mode operation - Protecting I/O, memory, CPU, Kernels and micro-kernels – system calls- Structure of Operating System – Components of Computers – various components of operating systems. **PROCESS DESCRIPTION AND CONTROL:** Job/process concepts - Process Creation – Process Termination - Process states – Process Description – Process Control.

#### UNIT-II

**PROCESS SCHEDULING:** Scheduling basics - CPU-I/O interleaving - (non-)preemption - context switching - Types of Scheduling – Scheduling Criteria – Scheduling Algorithms.  
**PROCESS SYNCHRONIZATION AND DEADLOCK:** Concurrent Process – Principles of Concurrency – Race Condition - Mutual Exclusion – Critical section problems – Software support – Hardware Support – Operating System Support – Deadlock: Deadlock Prevention, Avoidance and Detection and recovery. (4)

#### UNIT-III

**MEMORY MANAGEMENT:** Memory hierarchy – Linking and Loading the process – Memory Management requirement - Fixed partitioning - Dynamic partitioning – Buddy Systems – Simple paging – Multilevel paging – Inverted paging – Simple Segmentation – segmentation and paging. (8)

#### UNIT-IV

**VIRTUAL MEMORY MANAGEMENT:** Need for Virtual Memory management – Demand Paging – Copy on write - Page Fault handling – Demand Segmentation – Combined demand segmentation and paging - Thrashing- working set model.

#### UNIT-V

**FILE SYSTEM MANAGEMENT:** Files – Access methods - File System Architecture – Functions of File Management –Directory and disk structure – file sharing – File system implementation – directory implementation - File Allocation – free space management.  
**I/O MANAGEMENT AND DISK SCHEDULING:** Organization of I/O function – Types of I/O devices – Logical Structure of I/O functions – I/O Buffering – Disk I/O – Disk Scheduling algorithms

#### TEXT BOOKS

1. Silberschatz A, Galvin P B and Gagne G, “Operating System Concepts Essentials”, John Wiley & Sons, New York, 2011.
2. William Stallings, “Operating Systems”, Pearson Education, New Delhi, 2009.



## SEMESTER – V

### Core-10: JAVA PROGRAMMING

#### UNIT – I

JAVA Evolution History – Features – How Java Differs from C and C++ – Java and Internet – Java and WWW – Web Browsers. Overview of Java Language Introduction – Simple Java Program – Structure – Java Tokens – Statements – Java Virtual Machine.

#### UNIT – II

Constants – variables – Data types – Operators and Expressions. Decision Making and Branching If, If..else, else..If Ladder, switch, ? operator. Decision making and looping while, do, for – jumps in loops – labeled loops. Classes, Objects and Methods

#### UNIT – III

Arrays, Strings and Vectors – Interfaces Multiple Inheritance – Packages Putting classes together – Multi Threaded Programming.

#### UNIT – IV

Managing Errors and Exceptions – Applet Programming – Graphics programming.

#### UNIT – V

Files Introduction – Concepts of Streams – Stream classes – Using Streams – I/O classes – File class – I/O Exceptions – creation of files – Reading / Writing characters / Bytes – Handling primitive data types – Random access Files.

#### TEXT BOOKS

1. E. Balagurusamy “Programming with Java - A Primer”, TMH Publ., 2<sup>nd</sup> Edition, 2000.

#### REFERENCE BOOKS

1. Patric Naughton, and Herbert Schildt “The Complete Reference Java 2” Tata McGraw Hill Publishers, 2000.
2. C. Xavier “Programming with Java 2”, Scitech Publ., 2000.

## SEMESTER – V

### Core-11: COMPUTER NETWORKS

#### UNIT – I

Introduction The Uses of Computer Networks – Networks hardware – Network software – Reference models.

#### UNIT – II

The Physical Layer Transmission Media – Communication satellites – Wireless transaction-Telephone system

#### UNIT – III

The Data Link layer Data link layer Design Issues – Error Detection and Correction-Elementary Data link protocols. Medium Access Sub layers The channel allocation problem – Multiple access protocols Carrier sense multiple access protocols, collision –free protocols, Limited.

#### UNIT – IV

The Network Layer – Network Layer Design Issues – Routing Algorithms The optimality principle, shortest path routing, flooding, and distance vector routing, routing for mobile hosts.

#### UNIT – V

The Transport Layer – The Transport service – Services provided to the upper layers, transport service primitives – Elements of Transport protocols. Application Layer – DNS – The Domain Name System – Electronic mail – Architecture and services, the user agent.

#### TEXT BOOKS

1. Andrew S. Tanenbaum, “Computer Networks“, 3<sup>rd</sup> or 4<sup>th</sup> Edition, Pearson Education Publ.

#### REFERENCE BOOKS

1. Miller, ”Data and Network Communications”, Viaks Publ., 2001.
2. William A Shay, “Understanding data communications and Networks”, 2<sup>nd</sup> Edition, Vikas Publ., 2001.

## SEMESTER – V Practical 5: JAVA PROGRAMMING LAB

### LIST OF PRACTICALS

1. Write a program to print the following triangle of numbers

```
1
12
123
1234
12345
```

2. Define a class with the following attributes

- 1) Name
- 2) Date of birth
- 3) Date on which leg injection has to be given  
(60 days from date of birth)
- 4) Date on which polio drops is to be given  
(45 days from date of birth)

Write a constructor to construct the baby object. The constructor must find out the leg and polio drops dates from the date of birth. In the main program define a baby and display its details.

3. Write a program which creates and displays a message on the window.
4. Write a program to draw several shapes in the created window.
5. Write a program to create an applet and draw grid lines.
6. Write a Java program to create a frame with two buttons called father and mother. When we click the father button the name of the father, his age and designation must appear. When we click mother similar details of mother appear.
7. Write a Java Program to create a frame with Three Text fields for the Name, Age, Qualifications and a Text field of multiple lines for Address with suitable labels. Also add a button called my details. When you click the button your Name, Age, Qualifications and Address must appear in the respective Text fields.
8. Write a Java program to demonstrate the multiple selection list boxes.

9. Write a program to create a canvas which displays a clock with hour hand and minute hand depending upon an int variable minutes. Write another program with a frame which displays the clock canvas. It must also have three buttons, tick, reset and close. When we click reset, the clock must reset to 12 hrs. When we click close, the frame closes.
10. Write a Java program to create a menu bar and pull down menus.
11. Write a Java program to create a window when we press  
M or m the window displays Good Morning.  
A or a the window displays Good Afternoon.  
E or e the window displays Good Evening  
N or n the window displays Good Night
12. Write a program to move different shapes (Circle, Ellipse, Square, Rectangle) according to the arrow key pressed.
13. Write a Java program to create a frame which responds to the mouse click. For each event with mouse (such as mouse up, mouse down etc) the corresponding message must be displayed.
14. Write a program to draw circle, ellipse, square, and rectangle at the mouse click position.
15. Write a program to handle the divide by zero exception.
16. Write a program to create an exception called pay out of bounds and throw the exception.
17. Write a Java program to explain the multithreading with the use of multiplication tables. Three threads must be defined. And each one must create one multiplication table; they are 5 table. 7 table and 13 table.
18. Write a program to illustrate thread priority. Create three threads and assign three different priorities.

## **SEMESTER – V**

### **Skill Based Subject -III: COMPUTER GRAPHICS**

#### **UNIT – I**

Overview of Graphics System – Display Devices – CRT – Random Scan and Raster Scan Monitors – Techniques for Producing Color Display – Beam – Penetration and Shadow – Mask Methods – DVST – Plasma – Panel Displays – Hardcopy Devices – Printers and Plotters – Display Processors – Output Primitives – DDA and Bresenham’s line drawing algorithms – Antialiasing lines – Bresenham’s Circle Algorithm – Character Generation.

#### **UNIT – II**

Two-dimensional Transformations – Scaling, Translation and Rotation – Matrix Representations – Composite Transformations – Reflection – Shearing. Windowing and Clipping – Concepts – Cohen and Sutherland Line Clipping Algorithm – Midpoint Subdivision.

#### **UNIT – III**

Interactive Input Methods – Keyboard – Light Pens – Tablets – Joysticks – Track ball – Mouse – Picture construction Techniques – Pointing and Positioning – Rubber band methods – Dragging.

#### **UNIT – IV**

Three-Dimensional Concepts – Display Techniques – Parallel Projection – Perspective Projection – Three-Dimensional Transformations for Scaling, Translation – Rotation, Reflection, Shearing.

#### **UNIT – V**

Hidden-Surface and Hidden-Line removal – Back face removal – Depth Buffer Method – Scan Line Method – BSP Tree Methods – Depth-Sorting Method – Area-subdivision Method – Octree Methods – Comparison of Hidden-Surface Methods.

#### **TEXT BOOKS**

1. Donald Hearn and Pauline Baker, Computer Graphics, Prentice Hall of India, 2001.

**SEMESTER – V**  
**Non-Major Elective Paper-I: INFORMATION TECHNOLOGY – 1**  
**(Fundamentals of Computers)**

**Subject Description**

This course presents the basics of data and information, acquiring graphical data, data Storage, Computer software, Computer networks, Data organization.

**Goal**

To enable the students to learn the basic types of data, image compression fundamentals, memory cell, CPU

**Objectives**

On successful completion of the course the students should have:

- Understood the concepts of data and information.
- Understood the concepts of data storage, Software, Hardware and Internet.

**UNIT – I**

**Introduction and Data Representation in Digital Computers:** Historical Background of computing-Merits and limitations of computers-First to Fifth Generation of Computers-Characteristics of Computers-Classification of Computers.

**UNIT – II**

**Representation of Characters, Integers and Fractions-**Octal and Hexadecimal number systems-Signed-Fixed and floating point number representations-BCD Code-Gray Code-ASCII Code.

**UNIT – III**

**Building blocks of Computer:** Anatomy of Digital Computer : Functions of CPU , ALU and Control Units.

**Data Storage:** Introduction – Memory Units : RAM, ROM, EPROM,EEPROM.

**UNIT – IV**

**Input Devices:** Keyboard, Mouse, joystick, MICR, OCR, Barcoding, Speech.

**Output Devices:** Printers, Plotter, VDU, Graphic Display Devices.

**UNIT – V**

**Auxiliary Storage Devices:** Magnetic Tapes, Magnetic Disks, Floppy Disks, Hard Disks and Drives.

**CD-ROM, other Optical Devices:** WORM, Erasable optical disks, touch Screen optical device.

**REFERENCE BOOKS**

1. R.Rajaram, “Basic Computer Science and Communication Engineering”, Scitech Publications,1998.

## **SEMESTER – VI**

### **Core-12: VISUAL BASIC PROGRAMMING**

#### **UNIT –I**

Introduction - VB Environment – VB Fundamental: Constants, Variables, Data Types, Data Declaration – Operators – Expressions – Library Functions.

#### **UNIT –II**

Branching And Looping: If...Then, If-Then-Else, Else If, Nested If, Selected-Case, For-Next, Do-Loop, While-Wend, Nested Loops, Stop Statement. VB Controls: Textbox – Checkbox – List Box – Combo Box –Label – Command Button – Directory List –Box –Drive List Box. Assigning Values to Forms and Controls – Naming Controls and Forms – Executing Commands – Displaying O/P Data – Assigning Properties Collectively Using ‘With’ Block

#### **UNIT –III**

Timer Control, Scroll Bar, Message Box (), Input Box (), Functions, MDI Forms, Menus And Dialog Boxes: Building Drop – Down Menus, Sub Menus - Pop - Up Menus –Dialog Boxes – Debugging And Executing A Projects –Error Handling –Convert –VB Project To Exe File – Procedures – Scope- Optional Arguments.

#### **UNIT –IV**

Arrays –Parsing Arrays To Procedures- Dynamic Arrays –Array Function –Control Arrays –Data Files –Processing A Data Files –Sequential File –Random Access File.

#### **UNIT –V**

Database Programming With VB: Understanding Database Management Systems –Understanding Relation Concepts – Using Visual Data Manager- Validating Data – Enter Data –Accessing Fields In Record Sets –SQL – Advanced Data –Bound Controls –Managing Databases. Active Data Objects: Crating Data Project –Designing With The Data Environment Active x Designer –Ado Data Control.

#### **Text Books :**

1. Byron S. Gottfried, Ph.D, “Visual Basic” Schaum’s Outlines.
2. Gary Cornell , “Visual Basic 6 from the GROUND UP” , TATA McGRAW- HILL EDITION.

#### **Reference Books:**

1. David Jung , Pierre Boutquin , John D.Conley III , Loren Eidahl , Lowell Mauer , Jack Purdum , “Visual Basic 6 , Super Bible” , Techmedia.
2. Peter Wrights , “ Beginning Visual Basic 6 “ , SPD .
3. Steven Holzner , “Visual Basic 6 Black Book “ , Dreamtech Press , 2000.

**SEMESTER – VI**  
**Core-13: ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS**

**UNIT – I**

Introduction AI problems – AI techniques – Criteria for success, Problems, Problem Spaces, Search State Space Search – Production Systems – Problem Characteristics – Issues in Design of Search.

**UNIT – II**

Heuristic Search Techniques Generate and Test – Hill Climbing – Best-First, Problem reduction, Constraint Satisfaction, Means – end Analysis.

**UNIT – III**

Knowledge Representation Issues Representations and Mappings – Approaches to Knowledge Representations – Issues in Knowledge Representations – Frame Problem.

**UNIT – IV**

Using Predicate Logic Representing Simple Facts in logic – Representing Instance and Is a relationships – Computable Functions and Predicates – Resolution – Natural Deduction.

**UNIT – V**

Representing Knowledge Using Rules Procedural Vs Declarative Knowledge – Logic Programming – Forward Vs Backward Reasoning – Matching – Control Knowledge - Expert Systems.

**TEXT BOOKS**

1. Elaine Rich and Kevin Knight “Artificial Intelligence” , Tata Mcgraw Hill Publishers Company Pvt. Ltd, Second Edition, 1991. [Chapters (1 – 6 only)].

**REFERENCE BOOKS**

1. Artificial Intelligence, George F. Luger, 4<sup>th</sup> Edn., Pearson Edn., Asia, 2002.



## **SEMESTER – VI**

### **Practical 6: VISUAL BASIC PROGRAMMING LAB**

#### **LIST OF PRACTICALS**

1. Write a VB application for Student Mark List Processing System.
2. Write a VB application to Automate Banking System.
3. Write a VB application for Library Management System.
4. Write a VB application for Inventory Management System.
5. Write a VB application for Gas Agency Billing System.
6. Write a VB application for exercising (B.Sc., Computer Science) UG Admission in Government Arts College, Coimbatore.
7. Write VB coding for Font application.
8. Write a VB program for exercising Notepad application.
9. Write a VB application for processing Payroll using DAO control.
10. Write a VB application for Hospital Management System.
11. Write a VB application for Sales Order Processing (News Paper Vendor) using ADO.

## SEMESTER – VI

### Skill Based Subject -IV: WEB PROGRAMMING

#### UNIT – I

**INTRODUCTION:** Basics of web- web page – web site – Internet Vs WWW- Domain Names - Do's and Dont's of creating a web site - .Choosing a web host and getting your own website

#### UNIT – II

**HTML:** Structure of HTML Program – Core Elements – Links and Addressing – Images –Layout Design – Tables – Frames – Form

#### UNIT – III

**CSS :** Style sheet Basics – Adding Style to a Document – Creating Style Rules – Fonts – Text Formatting – Padding, Margins & Borders – Colors and Backgrounds – Tables – Element Positioning.

#### UNIT – IV

**VB SCRIPT:** Basics – Internal VBScript - External VBScript - Data Types – Variables – Array – Lifetime - Controls Structures – Operators – Functions

#### UNIT – V

**CASE STUDY:** Multimedia in Web site - Study of Adobe Photoshop and Macromedia Flash

#### TEXT BOOKS

1. Bryan Pfaffenberger, Steven M Schafer, Chuck White and Bill Karow, “HTML, XHTML, & CSS Bible”, Wiley Dreamtech, New York, 2004.
2. Thomas A Powell, “HTML –The Complete Reference”, Tata McGraw Hill, New Delhi, 2006.

#### REFERENCES

1. Paul Lomex, Matt Childs, Ron Petrusa, “VBScript in a nutshell”, O'Reilly, 2003
2. Eric A Meyer, “Cascading Style Sheets: The Definitive Guide”, O'Reilly Publications, UK, 2000
3. Dick Oliver, Michael Morrison, “HTML and CSS”, Pearson Education, 2006

**SEMESTER – VI**  
**Non-Major Elective Paper-II: INFORMATION TECHNOLOGY- 2**  
**(OFFICE AUTOMATION)**

**UNIT – I**

**Problem Solving:** Problem Definition and Analysis – Algorithms – Flow Charts- Assembly Language- High Level language-Compilation. Problem testing Documentation **Data Processing:** Files and records.

**UNIT – II**

**Windows Basics:** Starting Windows – Moving and Resizing the Windows – Using menus in Windows – Opening multiple Windows – Windows Accessories: Formatting paragraphs and text – Finding and Replacing Text, Using Tabs – Using Notepad.

**UNIT – III**

**Microsoft Word:** Word Processing Overview – Creating And Editing Documents – Formatting Documents – Creating Tables – Mail Merging.

**UNIT – IV**

**Microsoft Excel:** Introduction – Creating a Worksheet – Formatting and Printing a Worksheet – Creating Charts.

**UNIT – V**

**Some Internet Application :** E-mail-WWW-Information Browsing Services.

**Business Information System:** Types of information needed by organization Computer and Business- System life cycle.

**TEXT BOOKS**

1. PC Software for Windows Made Simple – R.K. Taxali.
2. R.Rajaram, “Basic Computer Science and Communication Engineering”, Scitech Publications,1998.