

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

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

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, 7th Edition, 2010.

REFERENCE BOOKS

1. Ramesh Gaonkar, “Microprocessor Architecture, Programming and Applications with the 8085”, Penram International publishing (India) PVT. LTD., 6th Edition, 2013.
2. Aditya P Mathur, ”Introduction to Microprocessors”, McGraw Hill Education (India) Private Limited, 3rd 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”, 6th 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 , 3rd 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”, 13th 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.

| | | |
|-----------------|---|------------------------|
| Unit I | : | Ch.1.1-1.5. |
| Unit II | : | Ch. 4.1- 4.4 & 5.1-5.3 |
| Unit III | : | Ch.3.1-3.2 |
| Unit IV | : | Ch.6.1-6.6. |
| Unit V | : | 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., 2nd 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“, 3rd or 4th Edition, Pearson Education Publ.

REFERENCE BOOKS

1. Miller, ”Data and Network Communications”, Viaks Publ., 2001.
2. William A Shay, “Understanding data communications and Networks”, 2nd 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, 4th 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.

B. Sc. Syllabus

(Academic year 2018-2019 onwards)

B.Sc. Computer Science Degree Course
UG - SCHEME OF EXAMINATIONS: CBCS PATTERN
(For the students admitted during the academic year 2018-2019 and onwards)

| Part | Sub Code | Title of the Paper | Hrs. (wk) | Internal (CA) Marks | External Marks | Total Marks | Ext- Min. | Total Pass Mark | Credits |
|----------------------|----------|--|--------------|------------------------|-------------------|----------------|-----------|--------------------|---------|
| Semester – 1 | | | | | | | | | |
| I | 18TAM11L | Part-I: Language: Tamil I | 6 | 25 | 75 | 100 | 30 | 40 | 3 |
| II | 18ENG12L | Part-II: English I | 6 | 25 | 75 | 100 | 30 | 40 | 3 |
| III | 18BCS13C | Core 1 : Digital Computer Fundamentals | 4 | 25 | 75 | 100 | 30 | 40 | 3 |
| III | 18BCS14C | Core 2 : Problem Solving and Python Programming | 3 | 25 | 75 | 100 | 30 | 40 | 2 |
| III | 18BCS15P | Core Practical 1 : Python Programming Lab | 3 | 40 | 60 | 100 | 24 | 40 | 2 |
| III | 18BCS16A | Allied – 1: Statistics and Numerical Methods | 6 | 25 | 75 | 100 | 30 | 40 | 3 |
| IV | 18ENV1GE | Environmental Studies | 2 | 25 | 75 | 100 | 30 | 40 | 2 |
| | | | 30 | | | 700 | | | 18 |
| Semester – II | | | | | | | | | |
| I | 18TAM21L | Part-I: Tamil II | 6 | 25 | 75 | 100 | 30 | 40 | 3 |
| II | 18ENG22L | Part-II: English II | 6 | 25 | 75 | 100 | 30 | 40 | 3 |
| III | 18BCS23C | Core 3: C Programming | 5 | 25 | 75 | 100 | 30 | 40 | 4 |
| III | 18BCS24P | Core Practical 2: C Programming Lab | 5 | 40 | 60 | 100 | 24 | 40 | 3 |
| III | 18BCS25A | Allied – 2: Discrete Mathematics | 6 | 25 | 75 | 100 | 30 | 40 | 3 |
| IV | 15VAL2GE | Value Education– Gandhian Thoughts | 2 | 25 | 75 | 100 | 30 | 40 | 2 |
| | | | 30 | | | 600 | | | 18 |

| Part | Sub Code | Title of the Paper | Hrs (wk) | Internal (CA) Marks | External Marks | Total Marks | Ext- Min. | Total Pass Mark | Credits |
|-----------------------|----------|---|----------|---------------------|----------------|-------------|-----------|-----------------|---------|
| Semester – III | | | | | | | | | |
| III | 18BCS31C | Core 4 : Computer System Architecture | 5 | 25 | 75 | 100 | 30 | 40 | 3 |
| III | 18BCS32C | Core 5 : Data Structures | 5 | 25 | 75 | 100 | 30 | 40 | 3 |
| III | 18BCS33C | Core 6 : Object Oriented Programming with C++ | 5 | 25 | 75 | 100 | 30 | 40 | 3 |
| III | 18BCS34P | Core Practical 3 : C++ Programming Lab | 3 | 40 | 60 | 100 | 24 | 40 | 2 |
| III | 18BCS35P | Core Practical 4 : Assembly Language Programming Lab | 2 | 40 | 60 | 100 | 24 | 40 | 2 |
| III | 18BCS36A | Allied – 3 : Operations Research | 6 | 25 | 75 | 100 | 30 | 40 | 3 |
| IV | 18BCS37S | Skill Based Subject – I: Micro Processor & Assembly Language Programming | 4 | 25 | 75 | 100 | 30 | 40 | 3 |
| | | | 30 | | | 700 | | | 19 |
| Semester – IV | | | | | | | | | |
| III | 18BCS41C | Core 7 : Software Engineering | 5 | 25 | 75 | 100 | 30 | 40 | 4 |
| III | 18BCS42C | Core 8 : Database Management System | 5 | 25 | 75 | 100 | 30 | 40 | 4 |
| III | 18BCS43C | Core 9 : Java Programming | 5 | 25 | 75 | 100 | 30 | 40 | 4 |
| III | 18BCS44P | Core Practical 5 : Java Programming Lab | 3 | 40 | 60 | 100 | 24 | 40 | 3 |
| III | 18BCS45P | Core Practical 6 : DBMS Lab (SQL) | 2 | 40 | 60 | 100 | 24 | 40 | 2 |
| III | 18BCS46A | Allied – 4 : Business Accounting | 6 | 25 | 75 | 100 | 30 | 40 | 5 |
| IV | 18BCS47S | Skill Based Subject – II: Principles of System Software | 4 | 25 | 75 | 100 | 30 | 40 | 3 |
| V | 18EXA4GE | @Extension Activities: NCC/NSS/SPORTS//YRC | - | - | - | - | - | - | 1 |
| | | | 30 | | | 700 | | | 26 |

| Part | Sub Code | Title of the Paper | Hrs (wk) | Internal (CA) Marks | External Marks | Total Marks | Ext- Min. | Total Pass Mark | Credits |
|----------------------|----------|---|----------|---------------------|----------------|-------------|-----------|-----------------|------------|
| Semester – V | | | | | | | | | |
| III | 18BCS51C | Core 10: Operating System | 6 | 25 | 75 | 100 | 30 | 40 | 5 |
| III | 18BCS52C | Core 11 : Computer Networks | 6 | 25 | 75 | 100 | 30 | 40 | 5 |
| III | 18BCS53C | Core 12:HTML and Java Script | 6 | 25 | 75 | 100 | 30 | 40 | 5 |
| III | 18BCS54P | Core Practical 7 :HTML and Java Script Lab | 3 | 40 | 60 | 100 | 24 | 40 | 3 |
| III | 18BCS55P | Core Practical 8 : Linux Shell Programming Lab | 2 | 40 | 60 | 100 | 24 | 40 | 2 |
| IV | 18BCS56S | Skill Based Subject – III: Computer Graphics | 4 | 25 | 75 | 100 | 30 | 40 | 3 |
| IV | 18BCS5EL | Non-Major Elective Paper – I: (Office Automation) | 3 | 25 | 75 | 100 | 30 | 40 | 2 |
| | | | 30 | | | 700 | | | 25 |
| Semester – VI | | | | | | | | | |
| III | 18BCS61C | Core 13 : Visual Basic Programming | 6 | 25 | 75 | 100 | 30 | 40 | 6 |
| III | 18BCS62C | Core 14 : Artificial Intelligence and Expert system | 6 | 25 | 75 | 100 | 30 | 40 | 6 |
| III | 18BCS63P | Core Practical 9 : Visual Basic Programming Lab | 3 | 40 | 60 | 100 | 24 | 40 | 3 |
| III | 18BCS64P | Core Practical 10 :Open Source Computing Lab | 2 | 40 | 60 | 100 | 24 | 40 | 2 |
| III | 18BCS65V | Project & Viva – Voce | 5 | 20 | 80 | 100 | 32 | 40 | 10 |
| IV | 18BCS66S | Skill Based Subject – IV: Open Source Computing | 5 | 25 | 75 | 100 | 30 | 40 | 5 |
| IV | 18BCS6EL | Non-Major Elective Paper – II: Information Technology - 2 E-Commerce and Internet Security | 3 | 25 | 75 | 100 | 30 | 40 | 2 |
| | | | 30 | | | 700 | | | 34 |
| | | Total/Credits | | | | 4100 | | | 140 |

@ No External Examinations, Only Continuous Internal Assessment (CIA)

Includes 25/40 continuous internal assessment marks for theory and practical papers respectively
Project evaluation done by both Internal and External examiner for 80 Marks

| Year | Subject Title | Sem. | Sub Code |
|---------------------|-------------------------------|------|----------|
| 2018 -19 Onwards | DIGITAL COMPUTER FUNDAMENTALS | I | 18BCS13C |

Objective:

- To introduce the basics of Number system and Codes.
- To learn concepts of Logic Gates and Circuits Design
- To minimize number of Gates using Karnaugh map Minimization
- To familiarize the concepts of Data Processing Circuits and Flip Flops
- To introduce HDL

UNIT – I

DIGITAL SYSTEMS AND BINARY NUMBERS: Digital Systems - Binary Numbers- Number-Base Conversions - Octal and Hexadecimal Numbers - Complements of Numbers - Signed Binary Numbers - Binary Codes - Binary Storage and Registers

UNIT – II

BOOLEAN ALGEBRA AND LOGIC GATES - Introduction - Basic Definitions - Axiomatic Definition of Boolean Algebra - Basic Theorems and Properties of Boolean Algebra - Boolean Functions - Canonical and Standard Forms - Other Logic Operations - Digital Logic - Integrated Circuits.

UNIT – III

GATE-LEVEL MINIMIZATION - Introduction - The Map Method - Four-Variable K-Map - Product-of-Sums Simplification - Don't-Care Conditions - NAND and NOR Implementation - Other Two-Level Implementations - Exclusive-OR Function – HDL-Hardware Description Language.

UNIT – IV

COMBINATIONAL LOGIC - Introduction - Combinational Circuits - Analysis Procedure - Design Procedure - Binary Adder/Subtractor - Decimal Adder - Binary Multiplier - Decoders - Encoders - Multiplexers - HDL Model for Encoder, Decoder, Multiplexer.

SYNCHRONOUS SEQUENTIAL LOGIC - Introduction - Sequential Circuits - Storage Elements: Latches - Storage Elements: Flip-Flops – RS, JK, T, D Flipflops

UNIT – V

REGISTERS AND COUNTERS - Registers - Shift Registers - Ripple Counters - Synchronous Counters - Ring Counters – Johnson Counters

MEMORY AND PROGRAMMABLE LOGIC - Introduction - Random-Access Memory - Memory Decoding - Error Detection and Correction - Read-Only Memory - Programmable Logic Array

TEXT BOOKS:

1. Morris Mano M, Michael D Ciletti “Digital Design”, Fifth Edition, Pearson, 2013.

REFERENCES:

1. Donald P Leech, Albert Paul Malvino and GoutamSaha, “Digital Principles and Applications”, Tata McGraw Hill, 2007.
2. Salivahanan S., Suresh Kumar N, Vallavaraj A., “Electronic Devices and Circuits”, Tata McGraw Hill Co. Ltd., 2008.
3. Mehta V. K., “Principles of Electronics”, S Chand and Company Ltd., 2001.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|---|----------|-----------------|
| 2018 -19 Onwards | PROBLEM SOLVING AND PYTHON PROGRAMMING | I | 18BCS14C |

Objective:

- To introduce the basics of Programming languages
- To introduce the concepts of Python fundamentals
- To introduce the concepts of Control flow and Functions
- To familiarize the concepts of Modules and Packages

UNIT I

PROBLEM SOLVING: Introduction to Problem Solving- Program development- Analyzing and Defining the Problem - Modular Design – Algorithm - Flow Chart - programming language -Types of programming language - Program Development Environment.

INTRODUCTION: Python Interpreter – Program execution – Interactive prompt – IDLE User Interface.

UNIT II

DATA, EXPRESSIONS, STATEMENTS : values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT III

CONTROL FLOW, FUNCTIONS: Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion;

UNIT IV

STRINGS : string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, exponentiation, sum an array of numbers, linear search, binary search.

LISTS, TUPLES, DICTIONARIES: Lists: list operations, list slices, list methods, list loop - Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods.

UNIT V

FILES, MODULES, PACKAGES: Files and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions.

TEXT BOOKS:

1. Allen B. Downey, ``Think Python: How to Think like a Computer Scientist'', 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016 (<http://greenteapress.com/wp/think-python/>)
2. Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

REFERENCES:

1. John V Guttag, —Introduction to Computation and Programming Using Python”, Revised and expanded Edition, MIT Press , 2013

| Year | Subject Title | Sem. | Sub Code |
|---------------------|------------------------|------|----------|
| 2018 -19 Onwards | PYTHON PROGRAMMING LAB | I | 18BCS15P |

Objective :

- To write, test, and debug simple Python programs.
- To implement Python programs with conditionals and loops.
- Use functions for structuring Python programs.
- Read and write data from/to files in Python.

List of Experiments:

1. Compute the GCD of two numbers.
2. Find the square root of a number
3. Exponentiation (power of a number)
4. Find the maximum of a list of numbers
5. Find Mean, Median, Mode of a list of numbers
6. Sorting the numbers in Ascending and Descending order
7. Program for circulate the values of n variables
8. Program for Linear and Binary Search
9. Program for List operations
10. Find First n prime numbers
11. Add, Subtract, and Multiply matrices
12. Programs that take command line arguments (word count)
13. Find the most frequent words in a text read from a file

| Year | Subject Title | Sem. | Sub Code |
|---------------------|----------------------------------|------|----------|
| 2018 -19 Onwards | STATISTICS AND NUMERICAL METHODS | I | 18BCS16A |

Objective :

- Learn the basics of Statistics and Numerical Methods.
- Learn the Linear Regression, Curve Fitting
- Learn Numerical methods and Interpolations with Algorithms

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.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|---------------|------|----------|
| 2018 -19 Onwards | C PROGRAMMING | II | 18BCS23C |

Objective :

- Be exposed to the syntax of C.
- Be familiar with programming in C.
- Learn to use arrays, strings, functions, pointers, structures and unions in C.

UNIT – I

Over view of C-Importance of C-Sample C programs-Basic structure of C programs - **Constants, Variables, and Data Types** - 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 Operations -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. **Character Arrays and 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", Seventh Edition McGraw Hill Education India Private Ltd, 2017

| Year | Subject Title | Sem. | Sub Code |
|---------------------|-------------------|------|----------|
| 2018 -19 Onwards | C PROGRAMMING LAB | II | 18BCS24P |

Objective :

- Be familiar with C programming
- Be exposed to implementing abstract data types
- Learn to use files
- Learn to implement sorting and searching algorithms.

List of Experiments:

1. Write a program to find the sum, average, standard deviation for a given set of numbers.
2. Write a Program for the following String operations without using built-in functions
i) String Copy ii) String Compare iii) String Length
iv) String reverse v) String Concatenate vi) Palindrome Checking
3. Write a program to generate ‘n’ prime numbers.
4. Write a Program for Matrix addition, Subtraction and Multiplication
5. Write a Program to read a positive integer and reverse it.
6. Write a Program to check whether the given number is an Armstrong number or not
7. Write a program to print the student’s Mark sheet assuming Regno, Name, and Marks in five subjects in a structure. Create an array of structures and print the mark sheet in the university pattern.
8. Write a program that take a paragraph and a number (n) as input and word wraps the text to n characters for each line. Your program must ensure that break the word in half. If the word does not fit within the same line, the word should go to the next line
9. Write a program to perform all manipulations like insertion, deletion and modification in files.
10. 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.
11. Write a program that will print all the reverse the words of a given sentence in-place. For example, if the following is the input “**This is a line of text**” the output will be “**sihT si a enil fo txet**”
12. A factorion is a natural number that equals the sum of the factorials of its decimal digits. For example, 145 is a factorion because $1! + 4! + 5! = 1 + 24 + 120 = 145$. Write a program that will print all the factorions below 1000000
13. Write a program that encrypts a given string using mirror characters in the alphabet that is $a \leftrightarrow z, b \leftrightarrow y, c \leftrightarrow x$ and so on.
14. Write a program that will print all the palindrome words in a given sentence.
15. Abundant Numbers - A number n is said to be an abundant number if the sum of its proper divisors is greater than the number n. For example, 12 is an abundant number $1 + 2 + 3 + 4 + 6 = 16$. Write a program that will print all the abundant numbers below 1,000,000

| Year | Subject Title | Sem. | Sub Code |
|---------------------|----------------------|------|----------|
| 2018 -19 Onwards | DISCRETE MATHEMATICS | II | 18BCS25A |

Objective:

To extend student's Logical and Mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.

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, McGraw 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.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|-------------------------------------|------------|-----------------|
| 2018 -19 Onwards | COMPUTER SYSTEM ARCHITECTURE | III | 18BCS31C |

Objective:

- To make students understand the basic structure and operation of digital computer.
- To understand the hardware-software interface.
- To familiarize the students with arithmetic and logic unit and implementation of arithmetic operations.
- To expose the students to the concepts of Memory Organization.

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, Pearson, 2007.

REFERENCE BOOKS

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

| Year | Subject Title | Sem. | Sub Code |
|---------------------|------------------------|------------|-----------------|
| 2018 -19 Onwards | DATA STRUCTURES | III | 18BCS32C |

Objective :

- To apply advance C programming techniques such as pointers, dynamic memory allocation, structures to develop solutions for particular problems.
- To explain how to choose the appropriate data structure to solve a programming problem
- To compare and contrast the benefits of dynamic and static data structures implementations

UNIT I : C POINTERS

Pointers – Arrays and Pointers - Pointers and strings - Pointer and Address Arithmetic –Two Dimensional Arrays and Pointers - Pointers to Functions – Calling Mechanism – Call by value - Call by Pointer - Dynamic Memory Allocation – Structures – Pointer to Structures – Unions – Pointer to Union - Enumeration Types - Bit fields - Files.

UNIT II ARRAY BASED LINEAR DATA STRUCTURES

Data abstraction - Abstract Data Types (ADT) - Array ADT - Linear List ADT (Polynomials) - Stack ADT - Queue ADT - Evaluation of expressions.

UNIT III LINKED LIST BASED LINEAR DATA STRUCTURES

Singly Linked Lists - Linked Stacks and Queues - Polynomial ADT - Circularly Linked Lists - Doubly Linked Lists

UNIT IV NON LINEAR DATA STRUCTURES

Trees - Binary Trees - Traversals - Operations - Threaded Binary Trees - Binary Search Trees - Disjoint Sets

UNIT V SORTING

Insertion Sort – Shell Sort – Heap Sort - Merge Sort – Bucket Sort – External Sorting – Multiday Merge – Poly phase Merge – Replacement Selection

TEXT BOOKS:

1. PradipDey and Manas Ghosh, —Programming in C, Second Edition, Oxford University Press, 2011.
2. Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, —Fundamentals of Data Structures in C|| , Second Edition, University Press, 2008.

REFERENCES:

1. Robert Kruse, C.L.Tondo, Bruce Leung, ShashiMogalla , — Data Structures and Program Design in C|| , Second Edition, Pearson Education, 2007
2. Jean-Paul Tremblay and Paul G. Sorenson, —An Introduction to Data Structures with Applications|| , Second Edition, Tata McGraw-Hill, 1991.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|--------------------------------------|------|----------|
| 2018 -19 Onwards | OBJECT ORIENTED PROGRAMMING WITH C++ | III | 18BCS33C |

Objective:

- Learn the fundamentals of input and output using the C++ library
- Design a class that serves as a program module or package.
- Understand and demonstrate the concepts of Functions, Constructor and inheritance.

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 Languages - Structure of C++ Program - Tokens, Keywords, Identifiers, Constants, Basic data type, User-defined Data type, Derived Data type – Symbolic Constants – Declaration of Variables – Dynamic Initialization - Reference Variable – Operators in C++ - Scope resolution operator – Memory management Operators – Manipulators – Type Cast operators – Expressions and their types – Conversions – Operator Precedence - Control Structures

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 – Const Member 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 – Overloading Using Friend functions – manipulation of Strings using Operators.

UNIT – IV

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

UNIT – V

Pointers, Virtual Functions and Polymorphism: Pointer to objects – this pointer- Pointer to derived Class - Virtual functions – Pure Virtual Functions – C++ Streams –Unformatted I/O- Formated Console I/O – Opening and Closing File – File modes - File pointers and their manipulations – Sequential I/O – updating a file :Random access –Error Handling during File operations –

Command line Arguments.

TEXT BOOKS

1. E. Balagurusamy, “Object Oriented Programming with C++”, Fourth edition, TMH, 2008.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|---------------------|------|----------|
| 2018 -19 Onwards | C++ PROGRAMMING LAB | III | 18BCS34P |

Objective :

- Understand the fundamentals of object oriented concepts with C++.
- Be able to write a C++ program to solve various problems.

LIST OF EXPERIMENTS:

DATA STRUCTURES

1. Implement **LINEAR** and **BINARY SEARCH** to find a particular name in a list of names
2. **Implement Queue**. The following Operations over Queue should be allowed
 - a. Insertion
 - b. Deletion
 - c. Modification
 - d. Listing of elements
3. Implement Stack
4. 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
5. Implementation of various Tree Traversals schemes
6. Arrange a set of numbers in **ASCENDING ORDER** using **QUICK SORT**.
7. Arrange a set of numbers in **DESCENDING ORDER** using **HEAP SORT**.

OBJECTS and CLASSES

8. 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.
9. 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

10. 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.

11. 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

12. 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.
13. 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.
14. 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

15. 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

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

| Year | Subject Title | Sem. | Sub Code |
|---------------------|-----------------------------------|------|----------|
| 2018 -19 Onwards | ASSEMBLY LANGUAGE PROGRAMMING LAB | III | 18BCS35P |

Objective:

- To be familiar with Assembly Language
- General structure of an assembly language program
- Introducing Data representation in assembly

List of Experiments:

1. Data transfer instructions like:
 - i] Byte and word data transfer in different addressing modes.
 - ii] Block move (with and without overlap)
 - iii] Block interchange
2. Arithmetic & logical operations like:
 - i] Addition and Subtraction of multi precision nos.
 - ii] Multiplication and Division of signed and unsigned Hexadecimal nos.
 - iii] ASCII adjustment instructions
 - iv] Code conversions
 - v] Arithmetic programs to find square cube, LCM, GCD, factorial
3. Bit manipulation instructions like checking:
 - i] Whether given data is positive or negative
 - ii] Whether given data is odd or even
 - iii] Logical 1's and 0's in a given data
 - iv] 2 out 5 code
 - v] Bit wise and nibble wise palindrome
4. Branch/Loop instructions like:
 - i] Arrays: addition/subtraction of N nos.
 - ii] Finding largest and smallest nos.
 - iii] Ascending and descending order
 - iv] Near and Far Conditional and Unconditional jumps, Calls and Returns
5. Programs on String manipulation like string transfer, string reversing, searching for a string, etc.
6. Programs involving Software interrupts
7. Programs to use DOS interrupt INT 21h Function calls for Reading a Character from keyboard, Buffered Keyboard input, Display of String on console

| Year | Subject Title | Sem. | Sub Code |
|---------------------|----------------------------|------------|-----------------|
| 2018 -19 Onwards | OPERATIONS RESEARCH | III | 18BCS36A |

Objective :

- Formulate a real-world problem as a mathematical programming model
- Implement and solve the Game Theory
- Understand the theoretical workings of the simplex method for linear programming

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; Chapter11: 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, ,EightEdition, Pearson Education, Reprint 2009.
2. Problems in Operations Research, P.K Gupta and D.S. HiraS.Chand and Company Limited, Third Edition, Reprint 2000.
3. Operations Research Theory and Applications, J.K.Sharma, Macmillan India limited Second Edition, Reprint 2002

| Year | Subject Title | Sem. | Sub Code |
|---------------------|--|------|----------|
| 2018 -19 Onwards | MICRO PROCESSOR & ASSEMBLY LANGUAGE PROGRAMMING | III | 18BCS37S |

Objective:

- Collected knowledge on Intel 8085 architecture and its addressing modes
- Understood and the concepts of 8-bit processors
- Got the fundamental knowledge of 16-bit processors.
- Familiarity on interfaces and interrupts of Intel 8085
- Known the architecture and functionalities of 8086

UNIT-I

Microprocessor Architecture: Intel 8085 - Instruction Cycle - Timing diagram- Instruction Format - Addressing modes - Intel 8085 Instructions.

UNIT-II

Programming using 8085: Simple examples - 8-bit addition and subtraction - 16-bit addition - 8-bit decimal subtraction - complements of 8-bit and 16-bit number - shifting bits - - finding largest of two numbers - finding largest and smallest in an array - sum of series of numbers - 8-bit multiplication and division.

UNIT-III

Peripheral Devices and Their Interfacing I: Address Space Partitioning -Memory and I/O Interfacing - Interrupts of Intel 8085 - Interfacing Devices and I/O Devices/8255-Programmable peripheral Interface.

UNIT-IV

Peripheral Devices and Their Interfacing II: 8253- Programmable Interval Timer, 8259- Priority Interrupt Controller, 8279-Programmable Keyboard/Display Interface, 8251- USART, 8237/8257- Programmable DMA Controller.

UNIT-V

8086 Architecture and assembly language Programming: Basic - 8086 Configuration - minimum mode and maximum mode - CPU Architecture - Internal Operation – Machine language Instructions – instruction Execution timing – Assembler instruction format.

TEXT BOOKS

1. B. Ram, “Fundamentals of Microprocessors and Microcomputers”, Dhanpat Rai Publications Pvt. Ltd., 1998. Unit I : Chapter 3, 4; Unit II: Chapter 6; Unit III : Chapter 7
2. Y.C. Liu and G.A. Gibson, “Microcomputer Systems: The 8086/8088 family Architecture, programming and Design”, Prentice Hall of India, New Delhi, 1986. Unit IV: Ch 2; Unit V: Ch 3.1 - 3.9, 4.1.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|----------------------|------|----------|
| 2018 -19 Onwards | SOFTWARE ENGINEERING | IV | 18BCS41C |

Objective:

- Understand the phases in a software project
- Understand fundamental concepts of requirements engineering and Analysis Modelling.
- Understand the major considerations for enterprise integration and deployment.
- Learn various testing and maintenance measures

UNIT- I

INTRODUCTION: Software Engineering – Software Process – Generic Process Model – Prescriptive Process Model – Specialized Process Model – Unified Process – Agile Development – Agile Process – Extreme Programming – Other Agile Process Models – Software Knowledge – Core Principles – Process Framework Activity - Practices .

UNIT-II

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.

UNIT- III

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 – Pseudo code – Nassi-Shneiderman Diagram.

UNIT-IV

SOFTWARE TESTING & IMPLEMENTATION: Testing Strategies – Testing Tactics – Testing Methodologies and Debugging Methods – System Documentation Manuals - Document review - Software Training - Post Implementation Review - Maintenance Issues - Study of Automated Testing tools.

UNIT-V

UML: Introduction - Modeling Concepts and Diagrams – Use Case Diagrams – Class Diagrams – Interaction Diagrams – State Chart Diagrams – Activity Diagrams – Package Diagrams – Component Diagrams – Deployment Diagrams

TEXT BOOK:

1. Pressman R S, “Software Engineering – A Practitioner’s Approach”, Tata McGraw Hill, 2016.

REFERENCES:

1. Ian Sommerville, “Software Engineering”, Pearson Education, 2015.
2. Shari Lawrence Pfleeger and Joanne M. Atlee, “Software Engineering Theory and Practice”, Pearson Education, 2011.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|----------------------------|------|----------|
| 2018 -19 Onwards | DATABASE MANAGEMENT SYSTEM | IV | 18BCS42C |

Objective:

- To expose the students to the fundamentals of Database Management Systems.
- To make the students understand the relational model.
- To make the students understand the Security Issues in Databases.

UNIT-I

BASIC CONCEPTS: Introduction to databases – Conventional file processing – Purpose of database system – Characteristics of database approach – Advantages of using DBMS – Database concept and architecture – Data Abstraction – Data Models – Instances and Schema – Data Independence – Schema Architecture – Components of a DBMS – Database Languages – Database Manager – Database Administrator – Database Users.

UNIT-II

DATA MODELING: Introduction – Data associations – Entities, attributes, relationships – Constraints - Design of Entity Relationship data models (ERD) – Generalization – Aggregation – Conversion of ERD into tables – Introduction to Network data model and Hierarchical data model.

FILE ORGANIZATION: Storage device characteristics – Constituents of a file – Operations on file – Serial files – Sequential files – Index sequential files – Direct files – Binary and Secondary Key Retrieval – Indexing using Tree Structures.

UNIT-III

RELATIONAL MODEL: Introduction to Relational Data Model – Basic concepts – Enforcing data Integrity constraints – Relational Algebra Operations – Extended Relational Algebra Operations.

RELATIONAL DATABASE MANIPULATION: Introduction to Structured Query Language (SQL) – SQL Commands for defining Database, Constructing database, Manipulations on database – Basic data retrieval operations – Advanced Queries in SQL – Aggregation – Updates in SQL.

UNIT-IV

DATABASE DESIGN THEORY: Data base design process – Relational Database Design – Relation Schema – Anomalies in a database – Functional dependencies – Axioms – closure of a set of FD's - minimal covers - Normal forms based on primary keys – Second Normal form, Third Normal form, Boyce–Codd Normal form.

UNIT-V

DATABASE SECURITY, INTEGRITY CONTROL: Security and Integrity threats – Defense mechanisms – Transaction and concurrency control mechanisms- ACID properties, Serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks), Time stamping methods, optimistic methods, Database recovery management.

TEXT BOOKS:

1. Silberschatz A., Korth H. and Sudarshan S., “Database System Concepts”, Tata McGraw Hill, 2011.

2. Elmasri R. and Navathe S.B., “Fundamentals of Database Systems”, Pearson Education, 2016.

REFERENCE BOOKS :

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

| Year | Subject Title | Sem. | Sub Code |
|---------------------|-------------------------|-----------|-----------------|
| 2018 -19 Onwards | JAVA PROGRAMMING | IV | 18BCS43C |

Objective:

- To introduce the basics of Java Programming and JVM
- To impart Fundamental knowledge in Object Oriented Programming
- Ability to generate simple packages and to design Threads.

UNIT-I

Introduction: Benefits of OOPS- Java History-Java Features- Java Virtual Machine - Java Environment- Java Tokens- Constants- Variables- Data Types – Operators and Expressions-Decision Making and Branching- Decision Making and Looping.

UNIT-II

Classes, Objects and Methods: Classes and Objects - Constructors- Method Overloading- Static Members-Inheritance- Overriding Methods- Final Variables, Final Methods and Final Classes - Finalize Method- Abstract Methods and Abstract Classes –Visibility Control - Arrays - Strings.

UNIT-III

Interfaces, Packages and Thread: Defining Interface- Extending Interfaces Implementing Interfaces – Packages-Multithreaded Programming: Thread Life Cycle - Thread Exceptions – Thread Priority-Synchronization.

UNIT-IV

File Handling: Types of Errors – Exceptions- Syntax of Exception Handling Code-Multiple Catch Statements- Using Finally Statements- Managing Input / Output Files in Java: Concept of Streams-Stream Classes- Character Stream - Classes-Reading / Writing Characters- Reading / Writing Bytes- Handling Primitive Data Types- Random Access files.

UNIT-V

AWT and Applet: Event Handling Methods- Labels- Button Control- Check Box Control- Radio Button Control- Choice Control- List Control-Flow Layout- Border Layout-Grid Layout – Menu-Mouse Events-Applets: Life cycle of an Applet-Development and Execution of a Simple Applet.

TEXT BOOKS

1. E. Balagurusamy, “Programming with JAVA”, Tata McGraw Hill, New Delhi, 4th edition. Units- I, II, III and IV
2. C. Muthu, “Programming with JAVA”, Vijay Nicole Imprints Private Limited, Chennai, Second Edition, 2011. - Unit-V

REFERENCE BOOKS

1. PatricNaughton, and Herbert Schildt “Java - The Complete Reference” Tata McGraw Hill Publishers, 2011

| Year | Subject Title | Sem. | Sub Code |
|-----------------------------|-----------------------------|-------------|-----------------|
| 2018 -19 Onwards | JAVA PROGRAMMING LAB | IV | 18BCS44P |

Objective:

- To Understand and to implement various programming techniques of Java.
- Be able to use Java SDK environment to create, debug and run Java programs.

Experiments that uses the following Concepts:

1. Classes and Objects
2. Constructors
3. Inheritance
4. Method Overloading and Method Overriding
5. Interface
6. Exceptions handling
7. Packages
8. Multithreading
9. Input / Output streams
10. AWT Controls
11. Applet

| Year | Subject Title | Sem. | Sub Code |
|---------------------|----------------|------|----------|
| 2018 -19 Onwards | DBMS LAB (SQL) | IV | 18BCS45P |

Objective:

- To give a good formal foundation on the relational model of data.
- To present SQL and procedural interfaces to SQL comprehensively.
- To present the concepts of Triggers and stored procedures.
- To present and developing a Package using a Database.

List of Experiments:

SQL – ORACLE

1. Working with DDL and DML commands of SQL for creation and manipulation of single, multiple tables.
2. Working with PL/SQL, Triggers and stored procedures.
3. Embedded SQL
4. Developing a Package using a database.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|---------------------|------|----------|
| 2018 -19 Onwards | BUSINESS ACCOUNTING | IV | 18BCS46A |

Objective:

- To introduce the basics of Business Accounting.
- To knowledge of Journal and Ledger accounting.
- To familiarize the concepts of balance sheet and Purchase books.

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”, 13th Edition, Kalyani Publ.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|--------------------------------------|-----------|-----------------|
| 2018 -19 Onwards | PRINCIPLES OF SYSTEM SOFTWARE | IV | 18BCS47S |

Objective :

- To understand the Concept of system software and Compiler
- To understand the process of scanning and parsing.
- To know the design and implementation of assemblers, macro processor, linker and compiler.
- To have an understanding of loader, system software tools.
- To understand and know the working of Loader

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

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

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

REFERENCE BOOK

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

| Year | Subject Title | Sem. | Sub Code |
|---------------------|--------------------------|----------|-----------------|
| 2018 -19 Onwards | OPERATING SYSTEMS | V | 18BCS51C |

Objective:

- Study the basic concepts and functions of operating systems.
- Understand the structure and functions of OS.
- Learn about Processes, Threads and Scheduling algorithms.
- Understand the principles of concurrency and Deadlocks.
- Learn various memory management schemes.
- Study I/O management and File 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.

UNIT-III

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

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 - 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.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|--------------------------|----------|-----------------|
| 2018 -19 Onwards | COMPUTER NETWORKS | V | 18BCS52C |

Objective :

- Understand the division of network functionalities into layers.
- Be familiar with the components required to build different types of networks
- Be exposed to the required functionality at each layer
- Learn the flow control and Error control

UNIT – I

Introduction The Uses of Computer Networks – Networks hardware- Local Area Networks- Metropolitan Area Networks – Wide Area Networks – Wireless Networks - Internetworks – Network software – Design Issues of the layers – Interfaces and services – Connection-oriented and Connectionless services – Reference models – OSI reference model - Layers – Data transmission in OSI Model – The TCP/IP reference Model

UNIT – II

The Physical Layer Transmission Media – Magnetic Media – Twisted Pairs – Coaxial cable – Fiber optics –Wireless Transmission – The Electromagnetic Spectrum – Radio transmission – Microwave transmission – Infrared Transmission – Light transmission – The Telephone system – Structure of Telephone system – Modems – Trunks and multiplexing – FDM- TDM – Switching.

UNIT – III

The Data Link layer - Data link layer Design Issues – Services provided to Network layer – Framing – Error Control – Flow Control - Error Correcting codes – Error detecting codes - -Elementary Data link protocols- Simplex Protocols- Sliding Window Protocols - Medium Access Control Sub layer - The channel allocation problem – Multiple access protocols - Carrier Sense multiple access protocols, Collision –Free protocols, Limited Contention Protocols.

UNIT – IV

The Network Layer – Network Layer Design Issues – Store-and-Forward Packet Switching – Services provided to Transport Layer – Implementation of Connectionless and connection-oriented services - Routing Algorithms -The optimality principle - shortest path Algorithm - Flooding - Distance vector routing – Link state routing – Hierarchical routing – Broadcast routing - Routing for mobile hosts.

UNIT – V

Congestion Control Algorithms – Approaches – Traffic-aware Routing – Admission Control – Traffic Throttling – Load shedding - The Transport Layer – Services provided to the upper layers - Transport service primitives – Elements of Transport protocols – addressing – Connection Establishment – Connection Release – Error Control and Flow control – Multiplexing - Crash recovery - Application

Layer – DNS – The Domain Name System – Electronic mail – Architecture and services - the user agent – Message formats – Message Transfer – Final Delivery.

TEXT BOOKS

1. Andrew S. Tanenbaum, David J. Wetherall, “Computer Networks“, 5th Edition, Pearson Education Publ. - 2011

REFERENCE BOOKS

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

| Year | Subject Title | Sem. | Sub Code |
|---------------------|----------------------|------|----------|
| 2018 -19 Onwards | HTML AND JAVA SCRIPT | V | 18BCS53C |

Objective :

- Create a basic website using HTML and Cascading Style Sheets.
- Design and implement dynamic web page with validation using JavaScript objects and by applying different event handling mechanisms.
- Design rich client presentation using AJAX.
- Design and implement simple web page in PHP, and to present data in XML format.
- Design front end web page and connect to the back end databases

UNIT I

Markup Language (HTML5): Basics of Html -Syntax and tags of Html- Introduction to HTML5 - Semantic/Structural Elements -HTML5 style Guide and Coding Convention– Html Svg and Canvas – Html API“ s - Audio & Video - Drag/Drop - Local Storage - Web socket API– Debugging and validating Html.

UNIT II

Cascading Style Sheet (CSS3): The need for CSS – Basic syntax and structure Inline Styles Embedding Style Sheets - Linking External Style Sheets - Introduction to CSS3 – Backgrounds - Manipulating text - Margins and Padding - Positioning using CSS -Responsive Web Design .

UNIT III

Introduction to JavaScript: - Core JavaScript - Client-Side JavaScript - Lexical Structure : Character Set - Comments - Literals Identifiers and Reserved Words Optional Semicolons types, values, and variables-.**Expressions and Operators.**

Statements: Expression Statements - Compound and Empty Statements - Declaration Statements Conditionals - Loops - Jumps -Objects - Creating Objects - Querying and Setting Properties -Deleting Properties -Testing Properties - Enumerating Properties - Object Attributes - - Object Methods Arrays:- Creating Arrays - Reading and Writing Array Elements - -Adding and Deleting Array Elements - Iterating Arrays

UNIT IV

Functions : Defining Functions -Invoking Functions - Function Arguments and Parameters-Functions As Values - Functions As Namespaces - Closures - Function Properties, Methods, and Constructor - Functional Programming - **Classes and Prototypes** :Classes and Constructors - Java-Style Classes in JavaScript - Augmenting Classes - Classes and Types - Object-Oriented Techniques in JavaScript - Subclasses – Modules-**JavaScript in Web Browsers** : Client-Side JavaScript - Embedding JavaScript in HTML.

UNIT V

Window Object : Timers - Browser Location and Navigation - Browsing History - Browser and Screen Information - Dialog Boxes.

Scripting Documents : Overview of the DOM - Selecting Document Elements - Document Structure and Traversal - Attributes - Element Content - Creating, Inserting, and Deleting Nodes- Generating a Table of Contents.

Scripting CSS : Overview of CSS - Important CSS Properties - Scripting Inline Styles - Querying Computed Styles - Scripting CSS Classes - Scripting Stylesheets

TEXT BOOKS:

1. Thomas A. Powell, “HTML & CSS: The Complete Reference”, Fifth Edition, 2010
2. David Flanagan, “JavaScript: The Definitive Guide, Sixth Edition”, O'Reilly Media, 2011

REFERENCE BOOKS:

1. Harvey & Paul Deitel& Associates, Harvey Deitel and Abbey Deitel, “Internet and World Wide Web - How To Program”, Fifth Edition, Pearson Education, 2011
2. James Lee, BrentWare , “Open Source Development with LAMP: Using Linux, Apache, MySQL, Perl, and PHP” AddisonWesley, Pearson 2009
3. Thomas A Powell, Fritz Schneider, “JavaScript: The Complete Reference”, Third Edition, Tata McGraw Hill, 2013
4. Thomas A Powell, “Ajax: The Complete Reference”, McGraw Hill, 2008

| Year | Subject Title | Sem. | Sub Code |
|---------------------|--------------------------|------|----------|
| 2018 -19 Onwards | HTML AND JAVA SCRIPT LAB | V | 18BCS54P |

Objective:

- To provide practical experience in web development using tools like HTML, CSS and JavaScript.

HTML

1. Write a HTML program for creation of web site with forms, frames, links, etc.
2. Design a web site using HTML and DHTML. Use basic text formatting and image tags
3. Create a personal website using HTML and DHTML
4. Write a HTML program to display a traditional newspaper with the use of table tags

CSS 3.0

1. Implement a CSS programs describing layers, inline, internal and external style sheets
2. Develop a webpage using CSS to set the background color, font, and paragraph
3. Develop a webpage using external CSS to import classes for various HTML tags (Use link and import)
4. Develop a webpage in various styles using CSS

Java Script

1. Develop a web page to validate the registration, user login, user profile and payment by credit card pages using JavaScript by importing a .js file
2. Develop a web page to count the number of words and number of vowels in a passage
3. Develop a web page to display a digital clock at the status bar using JavaScript
4. Develop a tool tip text (for form validation) for a web page

| Year | Subject Title | Sem. | Sub Code |
|---------------------|-----------------------------|------|----------|
| 2018 -19 Onwards | LINUX SHELL PROGRAMMING LAB | V | 18BCS55P |

Objective:

- To write shell script programs to solve problems.
- To implement some standard Linux utilities such as ls, cp etc. using system calls.

List of Experiments:

1. Arithmetic Operations
2. Employee Details
3. Electricity Bill Preparation
4. Sorting
5. Factorial
6. Sum of Numbers
7. Exponent using shell Program
8. Swapping of two numbers
9. Greatest among three numbers
10. Odd or Even
11. Testing the files and directories
12. Expansion and Substitution

| Year | Subject Title | Sem. | Sub Code |
|---------------------|--------------------------|----------|-----------------|
| 2018 -19 Onwards | COMPUTER GRAPHICS | V | 18BCS56S |

Objective :

- Gain knowledge about graphics hardware devices and software used.
- Understand the two dimensional graphics and their transformations.
- Understand the three dimensional graphics and their transformations.
- Appreciate illumination and color models.
- Be familiar with understand clipping techniques.

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.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|-------------------|------|----------|
| 2018 -19 Onwards | OFFICE AUTOMATION | V | 18BCS5EL |

Objective:

- To understand basic computer operations and Operating System
- To become proficient in using: -
Microsoft Office Packages

UNIT-I

Basics of Computer: Definition - History & Generation of Computer -Applications of Computer - Advantages of Computer - Characteristics of Computer – Elements of Computer.

Operating System: Definition of OS - Functions of OS - Types of OS: Single- user, Multi-User, multi-task, RTOS.

UNIT-II

Introduction to MS-Office: MS-Word - Working with Documents - Formatting and Aligning of Documents – Setting Page Styles – Creating Tables - Drawing - Mail Merge – Creating letters and Faxes using Ms-Word – printing documents – shortcut keys – paper and printer selection.

UNIT-III

Introduction to MS-Power Point: introduction to presentation – Creating presentation sheets – formatting a presentation – adding effects to the Presentation-Shortcut keys of PowerPoint.

UNIT-IV

Introduction to MS-Excel: introduction to spread sheets and its applications – Menus – formula editing – Formatting spread sheets - toolbars and shortcut keys – setting formula – **working with sheets:** Sorting, Filtering, validation, consolidation, subtotal – Creating Charts – Drawing tools – Shortcut keys of Excel.

UNIT-V

Introduction to MS-Access: Introduction, planning a Database, Starting Access, Access Screen, creating a New Database, Creating Tables, Working with Forms, Creating queries, Finding Information in Databases, Creating Reports, Types of Reports, Printing & Print Preview – Importing data from other databases Viz. Ms-Excel etc – Shortcut Keys of Access.

TEXT BOOKS:

- 1) Microsoft Office 2007 Bible - John Walkenbach,Herb Tyson,Faithe Wempen,cary N.Prague,Michael R.groh,Peter G.Aitken, and Lisa a.Bucki -Wiley India pvt.ltd.
- 2) Computer Fundamentals - P. K. Sinha Publisher: BPB Publications

| Year | Subject Title | Sem. | Sub Code |
|---------------------|--------------------------|------|----------|
| 2018 -19 Onwards | VISUAL BASIC PROGRAMMING | VI | 18BCS61C |

Objective:

- Gain knowledge about VB Fundamentals.
- Understand the Branching and Looping
- Understand the VB properties.
- Be familiar with Displaying O/P Data and Designing with the Data Environment Active x Designer.

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, “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.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|--|------|----------|
| 2018 -19 Onwards | ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS | VI | 18BCS62C |

Objective:

- To familiarize Basic Concepts of Artificial Intelligence
- Various steps involved in artificial Intelligence
- Basic Concepts of 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 Isa 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, 4thEdn., Pearson Edn.,Asia,2002.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|------------------------------|------|----------|
| 2018 -19 Onwards | VISUAL BASIC PROGRAMMING LAB | VI | 18BCS63P |

Objective:

- Understand the language Visual Basic to a beginner's level
- Know what objects, methods and properties are and how we work with them
- Be able to code simple Library Management System

List of Experiments:

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.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|---------------------------|------|----------|
| 2018 -19 Onwards | OPEN SOURCE COMPUTING LAB | VI | 18BCS64P |

Objective :

- To provide practical experience in software development using open source tools like PHP and MySql.

List of Experiments:

1. Write a PHP program to validate the Textbox
2. Write a PHP program to draw different shapes
3. Write a PHP program to perform the string manipulation
4. Write a PHP program using MySQL table
5. Write a PHP program to perform user registration form using HTML tags
6. Write a PHP program to display date and time
7. Write a PHP program to check user login
8. Write a PHP program to create a college website
9. Write a PHP program for cookies and session scripts
10. Write a PHP program to perform file read, write, open and append operation.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|--------------------------------|-----------|-----------------|
| 2018 -19 Onwards | PROJECT & VIVA VOCE | VI | 18BCS65V |

Guidelines for Internal Assessment

Total Marks: 100

1) Title and Abstract submission (10 Marks)

- The Abstract should have at least 2 Pages.
- No Marks will be given if submitted after due date

2) Review: 1 (25 Marks)

* The Student should submit the following to the Respective Guides during this Review meeting

1) System Study / Analysis

- Existing System
- Proposed System
- Feasibility Analysis

2) System design (Which ever applicable to your Project)

- Data Flow Diagram
- System Flow Design
- ERD
- Table Design
- Input Design
- Modules Design

3) Review: 2 (25 Marks)

* The Students should submit the following to the respective Guides without fail

1) System Implementation

- About the Software used
- Implementation of modules

4) Review: 3 (25 Marks)

* The Students should submit the following to the respective Guides without fail

1) System Testing

- Testing Strategies
- Test Plan
- Testing Report of your Software

5) Rough Project Report Submission for correction (15 Marks)

6) Project Report Submission Total Marks 100*

***Note:**

1. 100 Marks will be converted into 20 marks.
2. If the Student fails to attend Review Meeting, respective marks will not be awarded and treated as "Absent".
3. The Student cannot submit project report, if they are absent for all Reviews.

| Year | Subject Title | Sem. | Sub Code |
|---------------------|-----------------------|------|----------|
| 2018 -19 Onwards | OPEN SOURCE COMPUTING | VI | 18BCS66S |

Objective :

To provide knowledge about Open Source Technologies and to help in understanding the programming aspects of Personal Home Page (PHP) and MySQL

UNIT – I :

PHP Introduction: History-unique features-basic development concepts. Using variables & operators: storing data in variables-understanding PHP’S data types-using constants-manipulating variables with operators.

UNIT – II :

Controlling program flow: if, if-else, if-else if-else, switch case, while, do while, for loop, combining loops, Interrupting and skipping loops, working with string & numeric functions: using string functions, using numeric functions.

UNIT – III :

Working with arrays: creating an array – Modifying array element – processing arrays with loops and iterators - using arrays with forms-working with array functions-working with date and time-creating user defined functions.Working with forms: creating a simple Input form –Accessing from- combining HTML and PHP code on single page –using hidden fields to save state –redirecting the user –working with file uploads

UNIT - IV :

Creating Classes: Introducing classes and objects-defining and using classes-using advanced OOPs concepts-using constructors and destructors-extending classes-adjusting visibility settings-working with files and directories: reading local file-remote file-specific segments of a file-writing files-processing directories-performing other file and directory operations.

UNIT – V :

Reading & Writing Files – Testing File Attributes – Managing Sessions And Using Session Variables – Destroying A Session. Storing Data in Cookies – Selecting Cookies – Removing Cookies Data – Deleting Cookies – Dealing With Date & Time.

TEXT BOOK :

1. VikramVaswani, “PHP: A Beginners guide”, Tata McGraw Hill, First edition, 2010.

REFERENCE BOOK(S):

1. Matt Doyle, “ Beginning PHP 5.3”, Wiley India pvt. Ltd, First edition, 2010.
2. Steve Suehring, Tim Converse, Joyce Park , “PHP 6 and MySQL 5”, Wiley India pvt. Ltd., First edition, 2010. Anx. UCS (3B.Sc. Computer Science) 2013 Onwards

| Year | Subject Title | Sem. | Sub Code |
|---------------------|----------------------------------|------|----------|
| 2018 -19 Onwards | E-COMMERCE AND INTERNET SECURITY | VI | 18BCS6EL |

Objective:

- After completing the subject, the students are familiar with E-Commerce, E-Marketing, E-Payment Systems and Data Security

UNIT-I

E-Commerce: History of E-commerce – Definition of E-Commerce – market models of E-Commerce - Applications of E-Commerce – Architectural of E-Commerce – Advantages and Disadvantages of E-Commerce.

UNIT-II

Technologies of the World Wide Web: World Wide Web - Internet Client-Server Applications - ISP.
E-Marketing: Traditional Marketing - Online Marketing - E-advertising - E-branding.

UNIT-III

E-Payment Systems: What are Internet Banking - Digital Payment Requirements - Digital Token-based E-payment Systems - Classification of New Payment Systems - Risks and E-Payment Systems.

UNIT-IV

Data Security: What is data security – Dimensions of E-security – E-security Requirements – Secure Electronic Transactions – Disposable credit numbers.

UNIT-V

Cyber Security: Cyber Security - Cyber Attacks – Hacking - SSL - Authentication and assurance of data integrity – Cryptographic based solutions.

TEXT BOOKS:

1. E-Commerce “the cutting edge of business” – 2nd Edition kamalesh K.Bajaj, Debjani Nag – Tata McGraw HILL. (UNIT: I & IV & V)
2. E- Commerce – An Indian perspective P.T. Joseph. S.J. Fourth edition. PHI 2012. (UNIT – II & III)

REFERENCE BOOKS:

1. E-Commerce strategy, technologies and applications David Whitley. Tata McGraw HILL.