Curriculum 2014-2017						
Semester	***Subject Code***	***Subject Name***	***C***	***L***	***P***	***T***
I		English	3	4	-	4
		Language	3	4	-	4
		Value Education	1	2	-	2
		General course –Introduction to computers and information technology	2	3	1	4
	CA/DC/M11	Digital Circuits	5	3	2	5
	CA/CE/M12	Computing Environment	5	2	3	5
	CA/GM/A1	Allied – Mathematics I	5	6	-	6
II		English	3	4	-	4
		Language	3	4	-	4
		Value Education	1	2	-	2
		General course – Introduction to computers and information technology	2	3	1	4
	CA/CT/M21	Programming using C	5	5	-	5
	CA/CL/M22	Programming using C Lab	5	-	5	5
	CA/DM/A2	Allied – Mathematics II	5	6	-	6
III		English	3	4	-	4
		Language	3	4	-	4
		Personality Development	-	2	-	2
	CA/DSA/M31	Data Structures and Algorithms	5	4	1	5
	CA/MP/M32	Microprocessors	5	4	1	5
	CA/SM/A3 CA/SD/A3	Allied – Computer Integrated Statistical Methods and optimization Technique–I / Systems Management –I	5	6	-	6
		Environmental Studies	2	4	-	4
	CA/MM/IE1	Inter-Disciplinary Elective– Multimedia Systems	3	3	1	4
IV		English	3	4	-	4
		Language	3	4	-	4
		Personality Development	3	2	-	2
	CA/OST/M41	Operating Systems	5	5	-	5
	CA/OSL/M42	Operating Systems Lab	5	-	5	5
	CA/OR/A4 CA/EC/A4	Allied – Computer Integrated Statistical Methods and optimization Technique–II / Systems Management –II	5	6	-	6
		Environmental Studies	2	4	-	4
	CA/MM/IE2	Inter-Disciplinary Elective– Multimedia Systems	3	3	1	4
V	CA/DB/M51	Database Management Systems	4	5	-	5
	CA/VBT/M52	VB.Net	4	5	-	5
	CA/VBL/M53	VB.NET and SQL Programming lab	4	-	4	4
	CA/CST/M54	Programming using C#	4	5		5
	CA/CSL/M55	-Programming using C# Lab	4	-	5	5
	CA/WD/GE1	General Elective – Web Application	3	2	2	4
	CA/SNA/SE1	Skilled Based Training–System and Network Administration	3	-	2	2
VI	CA/SE/M61	Software Engineering	4	5	-	5
	CA/WP/M62	Web Programming	4	4	-	4
	CA/JP/M63	Java Programming	4	4	-	4
	CA/JWL/M64	Java and Web Programming Lab	4	5	-	5
	CA/DCN/M65	Data Communication and Networking	4	4	2	6
	CA/PR/SE2	Project	5	-	6	6
		Extension Activities	1			
		TOTAL	**150**			

C-Credit, L–Lecture, P–Practical, T–total hours

*NCC/NSS/Sports/ Physical Education – 1 credit **TotalCredits** 149 + 1* = 150

SEMESTER I

GENERAL COURSE

INTRODUCTION TO COMPUTERS AND INFORMATION TECHNOLOGY

C	L	P	T
2	3	1	4

Unit I

Computer Hardware Input Hardware- Processing and memory (primary storage) hardware- Output hardware secondary storage hardware.

Computer software- System software - Application software. The processor, main memory and registers: The processor-specialized processor chips CISC.R ISC, AND M PP - Main Memory- registers. ROM chips.

Unit II

Input hardware: keyboard input- pointing devices-scanning devices- voice recognition- audio input devices- video and photographic input.

Output Hardware: Impact printers- Non impact printers- Plotters-Monitors.

Storage hardware : Tape storage- Diskette Storage - Hard disks Optical disks.

Unit III

System software components : Common operating system platforms DOS- and windows windows NT /windows 2000 - UNIX LINUX.

Productivity Software Tools: Word processing software spread sheet software - database management system software.

Unit **IV**

Communications Technology: Using computers to communicate technological basics THE MODIN ISDN, cable modems, ADS]. and dishes.

Communication Channels: Twisted pair coaxial cable fiber optic cable- satellite system - other wireless communication. Communication Networks - Types of Networks - topology.

Unit V

Uses of cmnmunications Technology: the Internet - Connecting to the Internet Internet address

The World Wide Web - Popular uses of the web - browsing the web searching the web experiencing multimedia on the web designing web pages

Reference Books

1. Sarah E Hutchinson, Stacey C Sawyer , Computers, Communications and Information. Tata McGraw Hill Publications, 2001 .
2. Peter Norton, Introduction to Computers, Seventh Edition, Tata McGraw I lilt Publications, 2010

CA/DC/M11 **DIGITAL CIRCUITS**

C	L	P	T
5	3	2	5

Unit I

Binary Systems: Binary Numbers, Number base conversion, Octal & hexadecimal numbers; Complements; Binary codes; Binary logic.

Unit II

Boolean Algebra & Logic gates: Basic Definition, Basic theorems & properties of Boolean algebra, Boolean functions, canonical & standard forms, other logic operations, digital logic operations.

Simplification of Boolean function: The Map method, Two and three variable maps, Four-variable maps, Product of sums simplification, NAND& NOR implementation, Don't care Conditions.

Unit III

Combinational Logic: Design procedures, Adders, Subtractors;

Combinational Logic with MSI & LSI: Binary parallel adder, Decimal adder, Magnitude comparator, Decoders, Encoders, Multiplexers, De-multiplexers.

Unit IV

Sequential Logic: Flips flops, Triggering of flip flops.

Unit V

Register & counters: Introduction, Registers, Shift Registers-Serial Transfer.

Reference Books

1. Mano, M..M., Digital Logic and Computer Design, Prentice Hall of India– 1994.
Leach, Malvino

C	L	P	T
2	2	3	5

CA/CE/M12 COMPUTING ENVIRONMENT

Unit I

A Conceptual Background: The UNIX architecture;features of unix;
Understanding the unix command: internal and external commands;command structure; man-Browsing the manual pages on-line;understanding the man documentation
General purpose utilities: cal, date, echo, passwd, who.

Unit II

The file system: the file, HOME variable, pwd, cd, mkdir, rmdir, ls, UNIX file system, **Handling ordinary files**: cat, cp, rm, mv, more; file; wc; cmp;
Basic file attributes: ls ;chmod;
The vi Editor: input mode; saving text and quitting; editing text**.**
The shell: the shell's interpretive cycle; pattern matching; escaping and quoting;

Unit 3

MS-Word: Creating documents menus; toolbars and their icons; creating a template; creating tables; inserting columns; inserting rows; insert picture; align picture; mailmerge.

Unit 4

MS Excel: Entering text in cells; entering formula; formatting cells;
MS-PowerPoint: starting powerpoint; changing font, font size and bold; moving the frame and inserting clip art; inserting a new slide; inserting picture; entering data to graph; organization chart;.

Unit 5

Introduction to the Internet: Networking; internet; electronic mail; world wide web; **Internet Technologies**: Modem; internet addressing; physical connections; telephone lines. **Internet Browsers**: Internet explorer; Netscape navigator.

Reference Books:

1. Sumitabha Das,Unix Concepts and Applications, third edition, Tata McGraw hill, 2003
2. Sanjay Saxena, MS office 2000 for everyone, Vikas publishing house pvt ltd.2001
3. Xavier C, World Wide Web design with HTML,Tata McGraw hill, 2000

C CA/GM/A1 **ALLIED –I**

C	L	P	T
5	6	-	6

MATHEMATICS - I

Unit I

Determinants and Matrices: Elementary properties of determinants and matrices. Matrix inversion, elementary transformations, determination of rank of a matrix. Eigen values and Eigen vectors of a matrix (Stressing on symmetric matrices). Cayley-Hamilton theorem - Cramer's rule. Consistency of a system of linear non-homogenous equations. (Statement only). Simple problems.

Unit II

Theory of Equations: Roots of polynomial equation, Irrational roots, complex roots, Relation between the roots and the coefficients, simple problems related to cubic equations only. Reciprocal equations.

Unit III

Differential Calculus: Derivative of a continuous function, rules of differentiation, Derivative of implicit function, hyberbolic and inverse functions, Successive differentiation. Leibnitz rule.

Unit IV

Integral Calculus: Introduction, Integration of a rational functions, algebraic expressions involving only one irrational quantity, rational functions of sinx and cosx, Trigonometric substitutions, Bernculli's formula for integration by parts.

Unit V

Differential equations: Definition, solutions of differential equations. Formation of differential equations, equations of the first order and of the first degree (first three types).

Reference books :

1. Narayanan S. and Manickavachagam , Allied Mathematics Vol.1& Vol.2.
2. M.K. Venkataraman, NPC, Engineering Mathematics Vol.1 & Vol.2,

SEMESTER II

	L	P	T
5	5	-	5

CA/CT/M21 PROGRAMMING USING C

Unit I

Overview of C: Importance of C, sample C program, C program structure, executing C program. Constants, Variables, and Data Types: Character set, C tokens, keywords and identifiers, constants, variables, data types, declaration of variables, Assigning values to variables--- Assignment statement, declaring a variable as constant, as volatile.

Operators and Expression*:* Arithmetic, Relational, logical, assignment, increment, decrement, conditional, bitwise and special operators, arithmetic expressions, operator precedence, type conversions, mathematical functions

Managing Input and Output Operators*:* Reading and writing a character, formatted input, formatted output.

Unit II

Decision Making and Branching: Decision making with If, simple IF, IF ELSE, nested IF ELSE ,

ELSE IF ladder, switch, GOTO statement.

Decision Making and Looping: While, Do-While, For, Jumps in loops.

Unit III

Arrays: Declaration and accessing of one & two-dimensional arrays, initializing two-dimensional arrays, multidimensional arrays..

Functions: The form of C functions, Return values and types, calling a function, categories of functions, Nested functions, Recursion, functions with arrays, call by value, call by reference , storage classes.

Unit IV

Structures and Unions: Defining, giving values to members, initialization and comparison of structure variables, arrays of structure, arrays within structures, structures within structures, structures and functions, unions.

Preprocessors: Macro substitution, file inclusion.

Unit V

Pointers: definition, declaring and initializing pointers, accessing a variable through address and through pointer, pointer expressions, pointer increments and scale factor, pointers and arrays, pointers and functions, pointers and structures.

File Management in C: Opening, closing and I/O operations on files, random access to files, command line arguments.

Reference books

1. E. Balagurusamy, Programming in ANSI C, Second Edition , Tata McGraw-Hill.
2. Byron Gottfried, Schaum's Outline Programming with C, Second Edition, Tata McGraw-Hill
3. Yashavant Kanetkar, Let Us C, Eighth Edition, BPB Publications.
4. Kernighan and Ritchie, The C Programming Language, Second Edition, Prentice Hall, 1998.

CA/**CLC/M2** **PRACTICAL IV-PROGRAMMING USING C**

C	L	P	T
2	-	*3*	*3*

LIST OF PROGRAMS

1.Variables , data types , Constants and operators

1. Evaluation of expression (ex : ((x+y) ^2 * (x+z))/w
2. Temperature conversion problem (Fahrenheit to Celsius)
3. Program to convert days to months and days (Ex: 364 days = 12 months and 4 days)
4. Solution of quadratic equation
5. Salesman salary(Given : Basic Salary, Bonus for every item sold, commission on the total monthly sales)

2.Decision making Statements

6. maximum of three numbers
7. Find the Grade of the students
8. Calculate Square root of five numbers (using goto statement)
9. Pay-Bill Calculation for different levels of employee (Switch statement)
10. Date validation(Switch statement)

3.Looping Statements

11. Fibonacci series
12. Factorial
13. Square Root table
14. Floyds Triangle
15. Pascal's Triangle
16. Evaluation of Series(Sin x, cos x, e^x …)
17. Program to Draw Histogram
18. Mean and Mode

4.Arrays

19. Prime numbers in an array
20. Sorting data(Ascending and Descending)
21. Matrix Multiplication
22. Matrix Expression
23. Evaluate a multiple choice test

5.Strings

24. Finding String Length
25. Read a Line of text from Terminals
26. String Copy
27. Printing Sequence of characters
28. Concatenation of strings
29. Comparison of Two strings

6. **Functions (use call by reference and call by value)**

30. Function with no arguments and no return values
31. Function to calculate x ^y
32. Function that convert lower case letters to upper case

7.Macros

33. write a macro that calculates the max and min of two numbers
34. Nested macro to calculate Cube of a number.

8.Structures

35. Book Shop inventory
36. Structure that describe a Hotel (name, address, grade, avg room rent , number of rooms) Perform some operations (list of hotels of a given grade etc.)
37. Structure for Cricket team

9.Pointers

38. Evaluation of Pointer expressions
39. Function to exchange two pointer values
40. A function that receives a character string and a character as argument and deletes all occurrences of this character in the string. The function should return corrected string with no holes.
41. Creation , insertion and deletion in a linked list
42. Polynomial expression evaluation

10.Files

43. Program to read a file and print the data.
44. Program to receive a file name and a line of text as command line arguments and write the text to the file
45. Program to copy the content of one file to another file.

C	L	P	T
5	6		6

CA/DM/A2

ALLIED MATHEMATICS II

Unit I

Set theory: set theory, set operations, computer representation of sets,mathematical induction, matrices, logic normal forms.

Unit II

Combinatorics and recurrence relations: permutations, combinations, partitions, binomial co-efficients, discrete numeric functions, recurrence relations.

Unit III

Isomorphism, homomorphism, representation of posets.

Unit IV

Graphs: Basic concepts, special graphs, paths, reachability and connectedness,euler and hamilton paths, fleury's algorithm, computer representation of graphs, linked representation of graphs

Unit V

Trees and automata:trees, computer representation of positional array, representation of algebraic expressions, tree searching.

Reference books

1. Tremblay, J.P, Manohar, R. Discrete Mathematical Structures with Applications to Computer Science, 2nd print 1988, McGraw Hill.
2. Kolman, Bernard, Robert C. Busby and Sharon Ross, Discrete Mathematical Structures, 3rd Edition, PHI.

SEMESTER III

CA/DSA/M31

DATA STRUCTURES AND ALGORITHMS

C	L	P	T
5	4	1	5

Unit I

Problem Solving: Problem solving phase; program methodologies; algorithms; efficiency of an algorithm; asymptotic notation; algorithmic paradigms – divide and conquer algorithm, greedy algorithm.

Unit II

Stacks and Queues: Stacks, representation of stack using arrays; representation of stack using linked lists, Queues - types of queues; representation of linear queues using arrays; representation of linear queues using linked lists.

Unit III

Linked List: Introduction; abstract data type; list ADT; basic operations in a singly linked list; basic operations in a doubly linked list

Unit IV

Trees: Trees; binary trees; representation of binary trees; binary tree traversal; binary search trees.

Unit V

Sorting and Searching: Bubble sort; insertion sort; selection sort; quick sort; merge sort; linear search, binary search.

Reference books

1. J. John Manoj Kumar. P. Sudharsan, Data Structures using C, RBA Publications, Second edition, 2005
2. Horowitz, Ellis, SartajSahni, and S. Rajasekaran. Fundamentals of Computer Algorithm, Galgotia, 1999.
3. Kruse, Robert. L, Bruce B. Leung, and Clovis L. Tondo.Data Structures and Program Design in C.

CA/MP/M32

C	L	P	T
5	4	1	5

MICROPROCESSORS

Unit I

Microprocessor, Micro Computers and Assembly Language: Microprocessor, Microprocessor Instruction set & Computer languages.

Introduction to 8085 Assembly language programming: Instruction, Data format, & storage, How to write, assemble & execute a simple program.

Microprocessor Architecture Microcomputer systems: Memory, Input and output devices, logic devices for interfacing.

Unit II

8085 Microprocessor Architecture: The 8085 Microprocessor unit,

Introduction to 8085 Instruction: Data transfer operations, Arithmetic operations, Logic operations, Branch operations, writing assembly language programs.

Unit III

Programming techniques with additional instructions: Programming techniques looping, counting and indexing; Additional data transfer and 16-bit arithmetic instructions; Logic operation rotate.

Unit IV

Counter & Time delay: Counters & Time delays.

Stack & Subroutines: Stack, Subroutine, Restart, Conditional Call & return instruction.

Unit V

Interrupts: The 8085 Interrupt; Vectored Interrupts.

General-purpose programmable peripheral devices: The 8255A programmable peripheral interface.

Reference Books

1. Ramesh S. Gaonkar, Microprocessor Architecture, Programming and Applications with 8085, Fourth Edition, Penram International Publishing
2. Douglas V. Hall, Microprocessors & interfacing programming & hardware, Second Edition, Tata McGraw Hill Edition.

C	L	P	T
5	6	-	6

CA/SM/A3

ALLIED

COMPUTER INTEGRATED STATISTICAL METHODS AND OPTIMIZATION TECHNIQUE - I

UNIT I

Diagrammatic and Graphical Presentation Of Data: Significance of diagrams and graphs; types of diagrams – types of bar diagrams – simple bar diagrams, multiple bar diagrams, sub-divided bar diagrams; graphs of frequency distributions -histogram, frequency polygon, cumulative frequency curves or ogives.

UNIT II

Measures of Central Value: Objectives of averaging, requisites of good average, types of averages – Arithmetic mean, Median, Mode.

Measure of Dispersion: Methods of studying variation – Inter-quartile range or the quartile deviation, mean deviation, standard deviation.

UNIT III

Correlation Analysis: types of correlation; Karl Pearson's coefficient; properties of coefficient of correlation; rank correlation coefficient.

Regression Analysis: Regression lines, regression equations.

UNIT IV

Interpolation: Introduction; Newton's Interpolation formulae; Lagrange's Interpolation formula; divided differences; Newton's divided difference formula

UNIT V

Numerical Differentiation and Integration: Numerical integration – Trapezoidal rule, Simpson's one third rule; Simpson's three eight rule.

Reference books

1. S. P.Gupta, Statistical methods, Sultan Chand & Sons. Thirty fourth edition, 2005
2. S. Arumugam, A.Thangapandi Isaac, A. Somasundaram, Numerical methods SCITECH publications Pvt ltd, Second edition 2005.

C	L	P	T
5	6	-	6

CA/SD/A3 **Allied – I**

SYSTEMS MANAGEMENT- I

UNIT I

Introduction to Information System development: Overview of SAD, Systems analysts work, Categories of information system, System development strategy, System development life cycle, Structured analysis, Development method, Tools for system development.

UNIT II

Managing application development portfolio: Preliminary investigation,Selecting the project development strategy, Requirement determination, Fact-finding techniques, Tools for documenting procedures and decisions.

UNIT III

Structured Analysis and development strategy: Structured analysis; data flow analysis; Features of dataflow strategy; Development dataflow diagrams,Development process; General rules for drawing logical flow data diagrams; Features of Data Dictionary,

UNIT IV

Analysis to design transition: Specifying application requirements, objective in designing an information system, Design features.

UNIT V

Output Design: Identifying output needs, Format of presentation, Designing printed output, Designing visual display output.

Input and Control Design: Objectives, Capturing data for input, Input validation. **File Design:** Basic file terminology, Data structure diagram, Type of files, file Organization.

Reference Books

1. James.A.Senn, Analysis & Design of information system, Second Edition, McGraw-Hill International edition
2. Elias. M. Awad ,System Analysis and Design, McGraw-Hill International edition

C	L	P	T
3	4	-	4

CA/MM/IE1 INTERDISCIPLINARY ELECTIVE

Unit I

Multimedia: Dawn of the new communications medium, definition, various classifications.

Multimedia Hardware : Typical multimedia system configuration,

Multimedia Software: drivers, player's tools and applications

Introducing the digital medium: Meeting the analog signals, secrets of digital recording – sampling rate and sampling size.

Unit II

Digital audio technology: computers and sounds, digital audio, definition,

Digital Audio Playback & Recording: Digital audio recording techniques, Digital audio editing techniques.

MIDI fundamentals: concept of MIDI, MIDI Vs digital audio, general MIDI standards, base level and extended level MIDI

Unit III

Text in Multimedia: Designing text for multimedia Hypermedia, Hypertexts.

World of colors: Basic concepts of color display, color monitors

Digital Imaging Fundamentals: Graphics in multimedia projects, raster and vector graphics.

Digital Image Development and Editing: Scanning techniques, graphics editing manipulation terminology.

Unit IV

Computer Animation & Video Fundamentals: Animation in multimedia projects, object and cell animation, **Video in multimedia projects-** digital video fundamentals, full motion and full screen videos, digital video file sizes.

Unit V

Flash Basics & tools: Flash editor, panels, timelines, tools. Basic drawing tools brush tool, freehand painting tool, paint bucket tool, fills enclosed areas with colors or gradients, arrow tool and sub selection tool, oval and rectangle tool, pen tool

Animation with flash- shape tween, Motion tween, guides and masks, working with mask

Text books:

1. S. Gokul, Multimedia Magic, Revised and Updated edition BPB Publications. (*Chapters 1,2,6)*-2nd Edition-2008.

2. Underdahl Brain, "Macromedia Flash MX – A Beginners Guide" , Dream Tech Press

Reference books

1. Vaughan Tay, Multimedia: Making it Work, Tata McGraw-Hill, Fourth edition, 1999
2. Reinhardt Robert, Dowd Snow , 2006," macromedia Flash 8 Bible" ,John Wiley&sons.
3. Vaughan Tay, Multimedia: Making it Work, Tata McGraw-Hill, Fourth edition, 1999

SEMESTER IV

C	L	P	T
5	5	-	5

OST/M41 OPERATING SYSTEMS

Unit I

Introduction: operating system, history (19940s to 1990s), distributed computing, parallel computation.

Process concepts: definition of process, process states, process state transitions, process control block, operations on process, suspend and resume, interrupt processing, nucleus of OS.

Unit II

Asynchronous concurrent processes: parallel processing, control structure for indicating parallelism (parbegin/parend), mutual exclusion, critical section, mutual exclusion primitives, implementing, Peterson's algorithm, n-process mutual exclusion, hardware solution to mutual exclusion, testandset instruction, semaphores, process synchronization with semaphores, producer-consumer relationship, counting semaphores, implementing semaphores.

Concurrent programming: monitors, message passing

Unit III

Deadlock and indefinite postponement: Resource concepts, four necessary conditions for deadlock, deadlock prevention, deadlock avoidance and Banker's algorithm, deadlock detection, deadlock recovery.

Unit IV

Job and processor scheduling: scheduling levels, scheduling objectives, scheduling criteria, preemptive vs non-preemptive scheduling, interval timer or interrupting clock, priorities, FIFO scheduling, RR scheduling, quantum size, SJF scheduling, SRT scheduling, HRN scheduling, multilevel feedback queues fair share scheduling.

Unit V

Real storage: storage organization, storage management, storage hierarchy, storage management strategies, contiguous vs non-contiguous storage allocation, single user contiguous storage allocation, fixed partition multiprogramming, variable partition multiprogramming, storage swapping.

Virtual storage organization: virtual storage basic concepts, multilevel storage organization, block mapping, paging basic concepts, segmentation, paging/segmentation systems.

Virtual storage management: page replacement strategies

Reference books

1. H.M. Deitel, Operating Systems, Second Edition, Pearson Education Asia, 1999
2. William Stallings, Operating System: Internals and Design Principles, Fifth Edition, Prentice-Hall of India, 2005.
3. A. Silberschatz, and P.B. Galvin., Operating Systems Concepts, Fifth Edition, John Wiley &Sons(ASIA) Pte Ltd.

C	L	P	T
5	-	5	5

CA/OSL/M42

OPERATING SYSTEM LAB

1. Introduction to Unix / Linux

File System, Unix Shell Commands, Text Editor

2. The Unix Shell

Processes: Create a new process; PS, PID, PPID commands.

Redirecting and piping, running a process in the background

Environment Variables

3. Problems to implement using C:

a) Process Control

Running UNIX Commands from C using system(). Creating sub processes using system calls Execl(), fork()

b) Inter process Communication

Semaphores, Interrupts and Signal handling

c) Processor Scheduling

FCFS, Round Robin, SPN scheduling

C	L	P	T
5	6	-	6

CA/OR/A4 **ALLIED**

COMPUTER INTEGRATED STTATISTICAL METHODS AND OPTIMIZATION TECHNIQUE - II

UNIT I:

Introduction to Operations Research: Operations research defined; characteristics of OR; scope of OR; models and modeling in OR – advantages and drawbacks of OR models.

Linear Programming – I : Linear programming defined; requirements of linear programming problem; general model of linear programming problem; formulating a problem as an linear programming model; graphic method of solution; some special cases in linear programming.

UNIT II:

Linear Programming – II: Principle of simplex method – basic terms involved in simplex procedure; computational aspect of simplex method; special situations encountered during the application of simplex method – unbounded solutions; two-phase simplex method.

UNIT III:

Transportation Problem: General structure of transportation problem; linear programming formulation of the transportation problem; solution procedure for transportation problem; methods for finding initial solution – North West Corner method, Least Cost method, Vogel's Approximation method; test for optimality – stepping stone method.

UNIT IV:

Assignment Problem: Approach of the assignment model; maximization in an assignment problem; unbalanced assignment problem.

Sequencing Problems: Basic terminology and notations; general assumptions; processing n-jobs through two machines, processing n-jobs through three machines.

UNIT V:

Project Management: Basic concepts of network analysis, time estimates in critical path analysis; critical path method (CPM); programme evaluation and review technique (PERT); distinction between PERT and CPM.

Reference books

1. V. K. Kapoor, Operations Research Techniques for management, Sultan Chand & Sons, Seventh revised edition, 2001.
2. Prem Kumar Gupta, D. S. Hira, Operations Research, S. Chand and co Ltd., First Edition, 1976
3. KantiSwarup, P.K Gupta, Man Mohan, Operations Research, Sultan Chand & Sons, Twelfth edition, 2004.

C	L	P	T
5	6	-	6

CA/EC/A4 **ALLIED**

SYSTEMS MANAGEMENT- II

(E-Commerce)

UNIT-I: What is e-commerce? – E-Commerce is not E-Business – the drivers – Myths You should know – Advantages and Issues in E-Commerce – Benefits and Limitations of the Internet
– Role of E-Strategy – Integrating E-commerce – E-Commerce Business Models – Management Implications.

UNIT-II: Mobile-Commerce-The Business of Time: What is M-Commerce? – Why wireless? – How wireless Technology is employed? – Wireless LAN – Wireless application Protocol - Implications for Management.

UNIT-III: Business-to-Business E-Commerce: What is B2B E-Commerce? – Supply chain Management and B2B – B2B Models – B2B Tools-EDI.

UNIT-IV: E-Security: Security in Cyberspace – Designing for Security – How much risk you afford? – The VIRUS – Security Protection and Recovery – Role of Biometrics - How to secure your system? – Security and Terrorism.

UNIT-V: Getting the money: Real World Cash – Electronic Money – Requirements for Internet-Based Payments – How would you like to pay? – B2B and E-Payment – M-Commerce and M-Payment – General Guide to E-Payment.

TEXTBOOK:

1. **ELECTRONIC COMMERCE from Vision to Fulfillment – Elias M. Awad**, 3rd edition, PHI.2004
(Chapters: 1, 6, 11, 13 &15)

REFERENCE BOOKS:

1. E-COMMERCE Strategy, Technologies and Applications – David Whiteley, 2001, TMH.
2. INTRODUCTION TO E-COMMERCE – Jeffrey F. Rayport, Bernard J. Jaworski, 2001

C	L	P	T
3	4	-	4

CA/MM/IE1 INTERDISCIPLINARY ELECTIVE

Unit I

Multimedia: Dawn of the new communications medium, definition, various classifications.

Multimedia Hardware : Typical multimedia system configuration,

Multimedia Software: drivers, player's tools and applications

Introducing the digital medium: Meeting the analog signals, secrets of digital recording – sampling rate and sampling size.

Unit II

Digital audio technology: computers and sounds, digital audio, definition,

Digital Audio Playback & Recording: Digital audio recording techniques, Digital audio editing techniques.

MIDI fundamentals: concept of MIDI, MIDI Vs digital audio, general MIDI standards, base level and extended level MIDI

Unit III

Text in Multimedia: Designing text for multimedia Hypermedia, Hypertexts.

World of colors: Basic concepts of color display, color monitors

Digital Imaging Fundamentals: Graphics in multimedia projects, raster and vector graphics.

Digital Image Development and Editing: Scanning techniques, graphics editing manipulation terminology.

Unit IV

Computer Animation & Video Fundamentals: Animation in multimedia projects, object and cell animation, **Video in multimedia projects-** digital video fundamentals, full motion and full screen videos, digital video file sizes.

Unit V

Flash Basics & tools: Flash editor, panels, timelines, tools. Basic drawing tools brush tool, freehand painting tool, paint bucket tool, fills enclosed areas with colors or gradients, arrow tool and sub selection tool, oval and rectangle tool, pen tool

Animation with flash- shape tween, Motion tween, guides and masks, working with mask

Text books:

3. S. Gokul, Multimedia Magic, Revised and Updated edition BPB Publications. (*Chapters 1,2,6)*-2nd Edition-2008.

4. Underdahl Brain, "Macromedia Flash MX – A Beginners Guide" , Dream Tech Press

Reference books

4. Vaughan Tay, Multimedia: Making it Work, Tata McGraw-Hill, Fourth edition, 1999
5. Reinhardt Robert, Dowd Snow , 2006," macromedia Flash 8 Bible" ,John Wiley&sons.
6. Vaughan Tay, Multimedia: Making it Work, Tata McGraw-Hill, Fourth edition, 1999

SEMESTER V

C	L	P	T
4	5	-	5

CA/DB/M51 DATABASE MANAGEMENT SYSTEMS

Unit I

Overview of Database Systems: Managing data; history; file systems versus DBMS; advantages of a DBMS; describing and storing data in a DBMS; queries in a DBMS; transaction management; structure of a DBMS.

Unit II

Introduction to Database Design: database design and ER diagrams; entities, attributes and entity sets; relationship and relationship sets; additional features of ER model; conceptual design with the ER model.

Unit III

Relational Model: Introduction to the relational model; integrity constraints over relations; enforcing integrity constraints; Querying relational data; logical database design: ER to relational; introduction to views; destroying/altering tables and views.
Relational Algebra and Calculus: relational algebra; relational calculus.

Unit IV

SQL Queries, Constraints, Triggers: Form of a basic SQL query; UNION, INTERSECT, and EXCEPT; nested queries; aggregate operators; null values; complex integrity constraints in SQL; triggers and active databases.

Unit V

Schema Refinement and Normal Forms: Normal forms – Boyce Codd normal form, third normal form; other kind of dependencies – fourth normal form, fifth normal form.

Reference books

1. Ramakrishnan, Raghu and Gehrke, Johannes, Database Management Systems, Third edition, McGraw-Hill 2003
2. Abraham Silberchatz, Henry F. Korth, S. Sudarshan, Database System Concepts, Fourth edition , McGraw-Hill, 2002
3. Date, C.J., An Introduction to Database Systems, Seventh edition, Addison-Wesley, 2000.

CA/VBT/M52 **VB.NET**

C	L	P	T
4	5	-	5

UNIT I

Introduction to .NET: .NET defined; .NET Framework; Visual Basic.NET.

UNIT II

Object oriented programming and VB.NET: Encapsulation, Inheritance, polymorphism; creating windows forms applications; creating a web form applications;
Arrays: Introducing arrays; multi dimensional arrays; dynamic arrays; the array class members;
Conditional logic: The if…then..else statement; select…case statement; do…loop statement; while…end statement; for…next statement.

UNIT III

Dialog boxes: introducing to dialog classes; the message box class; common dialog class; savefiledialog class; color dialog class; fontdialogclass.
Namespaces: creating namespaces; namespaces in .NET.

Unit IV

Classes and Objects: introduction to classes; creating a class; inside classes; overloading and overriding; constructors and destructors.

Unit V

Specific controls: derived controls --- button, checkbox, combo box, datagrid, hscrollbar and vscrollbar, radiobutton, textbox.

REFERENCE BOOKS

1. Bill Evjen, Jason Beres, et al, Visual basic .NET programming, first edition, IDG Books India Ltd, jan 2003.
2. Steven Holzner, VB.NET Programming ,Dreamtechpublications , 2003.

CA/VBL/M53 VB.NET AND SQL PROGRAMMING LAB

C	L	P	T
4	-	4	4

Controls

1. Text Box and Command buttons(Quadratic equation)
2. Radio buttons and check boxes(Online Test)
3. Hscroll bars(Clock)
4. Vscroll bars(colr change according to RGB)

Dialog Controls

5. Messgae box and Input box(Factrial and Fibonacci)
6. Common dialog Boxes

Object oriented programming

7. Classes and object(String Manipulation)
8. Method Overloading(Area of Different Shapes)
9. Inheritance(prime numbers)
10. Constructors(Powers of different data types.

Database Management- SQL

11. Creating Data Connection with basic SQL Commands
12. Employee payroll using system Data grid
13. Creating Quiz with levels and scores
14. A Mini project- Create an application with database connectivity with minimum of 5 forms.

CA/CST/M54 **PROGRAMMING USING C#**

C	L	P	T
4	5	-	5

Unit I

Creation of C#: C# family tree,, Relationship in .NET Framework,CLR, Managed vs unmanaged code, CLS ;

Overview of C#: Object oriented programming, executing the program in IDE & command line compiler;

Data types, Literals and variables: Important data type, integers, floating- point, the decimal type, characters, the bool type; Literals; Variables, type conversion & casting, type conversion in Expressions.

Unit II

Operators: Arithmetic operators, Relational & Logical operators, Assignment operators, Bitwise operators,

Control Statements: IF statements, Switch Statement, For loop, While loop, Do- while l loop, foreach loop, Break, Continue, goto.

Classes, Objects and Methods: Class fundamentals, creation of objects, Methods, Constructors and Destructors, new operator, this keyword.

Unit III

Arrays & strings: One-dimensional array, Muti-dimensional array, Jagged arrays, Strings.

Closer look at methods & classes: Method overloading, overloading constructors, the Main () method, Recursion.

Operator overloading: Operator overloading fundamentals,Operator overload on built-in types,overloading relational operators, logical operators, Enabling short-circuit operators.

Unit IV

Inheritance: Basics, Member access & inheritance, Virtual Methods and overriding, Abstract Classes.

Interfaces, Structures & Enumerations:interfaces, interface references, interfaces can be inherited;Structures.

Unit V:

Exception Handling: Exception handling fundamentals, using multiple catch statements, catching all exception, nesting try blocks, throwing an exception, using finally.

I/O: The Stream classes, console I/O.

Reference Books

1. Herbert Schildt, TheComplete Reference. C# 2.0, Tata McGraw-Hill Edition 2006.
2. Jesse Liberty. Learning C#, O'reilly publications,2002.

CA/CSL/M55

PROGRAMMING USING C# LAB

C	L	P	T
4	-	5	5

1. Introduction to .NET Framework

Variables and Literals
Operators
Control Statements
Arrays and Strings

2. Classes, Objects and Methods

Classes and Objects
Constructors and Destructors
Access Specifiers

3. Inheritance

Types
Virtual methods
Interfaces

4. Overloading and Overriding

Method Overloading
Method Overriding
Operator Overloading

5. Exception Handling

Try and Catch
Finally clause

CA/WD/GE1

GENERAL ELECTIVE WEB DESIGNING

C	L	P	T
3	2	2	4

Unit I

Introduction to the Internet: Networking, Internet, E-mail, resource sharing, gopher, www, Usenet, telnet, BBS.

Internet technologies: Modem, internet addressing, physical connection, telephone lines.

Unit II

Internet browsers: Internet explorer, Netscape navigator.

ntroduction to HTML: History to HTML, HTML generations, HTML documents, anchor tag, hyper links.

Unit III

Head & Body section: Header section, title, links, colorful web pages, comment lines.

Designing the body section:heading printing, aligning the heading, horizontal rule, paragrasph, tab settings, images & pictures.

Unit IV

Order & unordered list: Lists, Unordered list, headings in a list, ordered list, nested list.

Table Handling: Tables, Table creation in HTML, width of the tables& cells, Cell spanning multiple rows/columns, coloring cells, column specification.

DHTML & style sheets: Defining styles, elements of styles, linking the style sheet, in-line style, External style sheets, internal style sheets, and multiple styles.

Unit V

Frames: Frameset definition, Frame definition, Nested framesets, A web page design project:

Forms: Action attribute, Method attribute, Enctype attribute, drop down list, sample forms.

References Books

1. C.Xavier,World wide web design with HTML,Tata McGraw Hill,2000.
2. Musciano, Chuck and Bill Kennedy, HTML the definitive guide, Third Edition, O'Reilly, Shroff Publications and Distributors Pvt. Ltd.

CA/SNA/SEI

C	L	P	T
3	-	2	2

SYSTEM AND NETWORK ADMINISTRATION

Unit I

Hardware : PC-Memory - Rom BIOS, Types of RAM- SDRAM, DDRRAM - Cache Memory - Hard disk Drive-Jumper setting-Intel Series Mother Boards, Computer-server-client, cables, connectors, NIC-Network Interface Card, and Networking Devices.
BIOS Setup, SMPS- AT & ATX Power supply- Keyboard, Mouse, Monitor, Printers, Ethernet Cards - PC Assembling and Disassembling.

Unit II

Installation: Install and Unstall MS Office, Microsoft visual studio 2012, Flash, SQL Server, UBUNTU OS, Windows 8 operating System,Windows server 2008.

Unit-III

System Maintenance : Creating Partitions,System Tools - Disk cleanup, System information, Disk defragmented and System Restore IP Addressing.

Unit-IV

Installation of Ubuntu as a server: Configuring Network, setting up user accounts ,setting rights and polices,tools for setting Linux- SCP(Secure Copy),SSH (Secure Shell).

Unit -V

Domain creation and Networking: Active Directory, Creating User Accounts, Network file sharing.

Reference Books

1. Ubuntu unleashed, 2012 edition , Publisher: SAMS Publishing
2..*"Microsoft Windows Server 2008: The Complete Reference* is a one-stop-shop for learning all The essential steps for setting up Window Server 2008.
3.IBM PC and Clones Hardware, Troubleshooting and maintenance-Second Edition.

SEMESTER VI

CA/SE/M61

C	L	P	T
4	5	-	5

SOFTWARE ENGINEERING

Unit I

Introduction: The software engineering discipline, programs vs. software products, why study software engineering, emergence of software engineering, Notable changes in software development practices, computer systems engineering.

Software Life Cycle Models: Why use a life cycle model, Classical waterfall model, iterative waterfall model, prototyping model, evolutionary model, spiral model, comparison of different life cycle models.

Unit II

Requirements Analysis and Specification: Requirements gathering and analysis, Software requirements specification (SRS)

Software Design: Good software design, cohesion and coupling, neat arrangement, software design approaches, object- oriented vs function-oriented design

Unit III

Function-Oriented Software Design: Overview of SA/SD methodology, structured analysis, data flow diagrams (DFD's), structured design, detailed design.

User-Interface design: Characteristics of a good interface;basic concepts;types of user interfaces; component based GUI development, a user interface methodology.

Unit IV

Coding and Testing: Coding; code review; testing; testing in the large vs testing in the small; unit testing; black-box testing; white-box testing; debugging; program analysis tools; integration testing; system testing; some general issues associated with testing.

Software Reliability and Quality Management: Software reliability; statistical testing; software quality; software quality management system; SEI capability maturity model; personal software process.

Unit V

Computer Aided Software Engineering: CASE and its scope; CASE environment; CASE support in software life cycle; other characteristics of CASE tools; towards second generation CASE tool; architecture of a CASE environment.

Software Maintenance: Characteristic of software maintenance; software reverse engineering; software maintenance process models; estimation of maintenance cost;

Reference books :

1. Rajib Mall, Fundamentals of Software Engineering, Second Edition, Prentice-Hall of India, 2008
2. Richard Fairley, Software Engineering Concepts, Tata McGraw-Hill publishing companyLtd, Edition 1997.Roger S. Pressman, Software Engineering, Fifth Edition, McGraw-Hill.
3. James A. Senn, Analysis& Design of Information Systems, Second Edition, McGraw-Hill International Editions.

CA/WP/M62

C	L	P	T
4	4	-	4

WEB PROGRAMMING

UNIT I

HTML,XHTML and the World Wide Web: internet; HTML and XHTML;
Textof serving an active server page; using scripting languages.
Basics:divisions and paragraphs; headings;
Formatted Lists: Unordered lists; Ordered lists; usage.
Forms: <form> tag; <input> tag; <button> tag; multiline text areas; multiple choice elements.
Tables: basic table tags; advanced table tags.
Frames: Overview of frames; frame tags; frame layout; frame contents; <noframes> tag.

UNIT II

Introducing JavaScript and Jscript: JavaScript and browsers, JavaScript and Servers; Embedding JavaScript in HTML; JavaScript comments;
Operators, Statements and Functions: Operators and expressions;JavaScript programming statements.

Unit III

Handling Events: Handling JavaScript Events; Setting event handlers from with JavaScript; event object; event capturing; event bubbling; event handing;
Working with objects: JavaScript's Object-Based Programming Features; JavaScript object model; browser objects.

Unit IV

Introduction to ASP: active server page model; process
Understanding Objects: Built-in objects; active server pages objects; application object; request object; response object; properties of the response objects; methods of the response object; session object.

Unit V

Working with users: Input box function; msg box function; using html forms; using ActiveX Controls.
Working with HTML forms: retrieving form data; using text boxes and text areas.
Cookies: Working with cookies; application of cookies.

Reference Books:

1. Musciano, Chuck and Bill Kennedy, HTML the definitive guide, Third Edition, O'Reilly, Shroff Publications and Distributors Pvt. Ltd.
2. Jaworski, James, Mastering JavaScript and Jscript, BPB publications
3. Ivan Bayross, Practical ASP, First Indian Edition, BPB pulblications,2000.

CA/JP/M63

JAVA PROGRAMMING

C	L	P	T
4	4	-	4

Unit I

JAVA language: Creation of JAVA, Java applets, Java magic code, Servelts; Object-oriented programming, executing a java program using command line arguments.

Data types & Variables: The primitive types; Floating-point types; Characters; Booleans; Variables; Type conversion and casting.

Unit II

Operators: Arithmetic operators; Bitwise operators; Relational operators; Boolean logical operators; Assignment operator; Conditional operator;

Control Statements: if & switch statements; iteration statements; jump statements.

Unit III

Classes: Class fundamentals; Objects; Constructors; this keyword; finalize () method.

Methods: Overloading methods; Returning objects; Recursion; introducing access control; understanding static; introducing final; introducing nested and inner classes;

Strings: String operations; Character Extraction; Comparing, Searching & Modifying the strings; Data conversion using valueOf(); String Buffer.

Unit IV

Inheritance: Inheritance basics; using super; creating a multilevel hierarchy; method overriding; dynamic method dispatch; using abstract classes; using final with inheritance.

Packages and interfaces: Packages; access protection; importing packages; interfaces;

Multithread programming: The JAVA thread model; creating a thread; creating a multiple thread; Using isAlive() and join (), Interthread communication; suspending, resuming and stopping threads; using multithreading.

Unit V

Exception handling: Exception handling fundamentals; exception types; uncaught exceptions; using try and catch; multiple catch clauses; nested try statements; throw; throws; finally; Java's built-in exceptions;

Input/ouput: Java I/O classes and interfaces; file; the stream classes; byte streams; character streams; console class.

Applet class: appletbasics;applet architecture;simple applet skeleton; applet displaying methods;

Event handling: two event handling mechanisms;delegation event model; event classes; source of events; event listener interface

Reference Book:

1. Herbert Schildt, "The Complete Reference",Seventh Edition, Tata McGraw Hill, 2007.
2. Bruce, Eckel, Thinking in Java, Third edition, Pearson education, 2005

CA/JWL/M64 JAVA AND WEB PROGRAMMING LAB

C	L	P	T
4	-	5	5

Web Programming

1. Designing Web Pages:
   usage of tags (headers, paragraphs, strong, emphasize, etc.
2. Using buttons and links to change colours
3. Creating links, image tags and image mapping
4. Using lists and tables. Table using row span and colspan
5. Using functions to change colours
6. Simple interactive forms and submitting form data with validation
7. If statements with checkboxes and radio buttons
8. Drop down menus
9. Using Frames

JAVA Programming

1. Command line argument
2. Using constructors
3. String manipulations
4. Packages and interfaces
5. Class and methods
6. Multithreading
7. Functions and recursion
8. Exception handling
9. Applets
10. Awt classes

CA/DCN/M65 DATA COMMUNICATIONS AND NETWORKING

C	L	P	T
4	4	2	6

Unit I

Introduction: Data communication – components; networks – distributed processing, network criteria, applications; protocols and standards – protocols, standards.

Basic Concepts: Line configuration – point to point, multipoint; Topology – mesh, star, tree, bus, ring, hybrid technologies; transmission mode – simplex, half-duplex and full-duplex; categories of networks – LAN, MAN, WAN.

The OSI Model: Model – Layered architecture; functions of the layers – physical layer, data link layer, network layer, transport layer, session layer, presentation layer, application layer; TCP/IP protocol suite.

Unit II

Signals: Analog and digital – Analog and digital data , analog and digital signals; periodic and aperiodic signals; analog signals – simple analog signals, time and frequency domains; composite signals – frequency spectrum and bandwidth; digital signals - decomposition of a digital signal.

Transmission Media: Guided media – twisted pair cable, coaxial cable, optical fiber; unguided media – radio frequency allocation, propagation of radio waves, satellite communication, cellular telephony.

Multiplexing: many to one/ one to many; frequency division multiplexing; wave division multiplexing; time division multiplexing .

Unit III

Data Link Control: line discipline - ENQ/ACK, Poll/Select; Flow control-Stop-and-wait, sliding window; Error Control – Automatic repeat request(ARQ), stop- and-wait ARQ. .

Switching: circuit switching; packet switching.

Unit IV

Networking and Internetworking devices: repeaters; bridges; routers; gateways; routing algorithms – Distance vector routing; link state routing;

Transport Layer: Duties of the transport layer; connection; OSI transport protocol.

Unit V

Application Layer: Domain name system; telnet; file transfer protocol;Simple network management protocol; hypertext transfer protocol; World Wide Web.

Reference Books:

1. Behrouz, A. Forouzan, Data Communications and Networking, Second Edition, Tata McGraw-Hill publishing company Ltd 2003.
2. Andrew. S. Tannenbaum, Computer Networks, Prentice Hall of India Private Ltd, Third edition, 2005.

C	L	P	T
5	-	6	6

CA/PR/SE2

PROJECT

The Studentsare encouraged to design and develop any system using any programming language or package tools