

THIRUVALLUVAR UNIVERSITY

B.Sc. COMPUTER SCIENCE

DEGREE COURSE

CBCS PATTERN

(With effect from 2017 - 2018)

The Course of Study and the Scheme of Examinations

S.NO.	Part	Study Components		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
		Course Title					CIA	Uni. Exam	Total
SEMESTER I									
1	I	Language	Paper-1	6	4	Tamil/Other Languages	25	75	100
2	II	English	Paper-1	6	4	English	25	75	100
3	III	Core Theory	Paper - 1	6	6	Digital Logic & Programming in C	25	75	100
4	III	Core Practical	Practical-1	3	2	Programming in C Lab	25	75	100
5	III	ALLIED 1	Paper-1	7	4	(to choose any one) 1. Mathematics I 2. Mathematical Foundations I	25	75	100
6	IV	Environ. Studies		2	2	Environmental Studies	25	75	100
				30	22		150	450	600
SEMESTER II									
7	I	Language	Paper-2	6	4	Tamil/Other Languages	25	75	100
8	II	English	Paper-2	4	4	English	25	75	100
9	III	Core Theory	Paper-2	6	6	C++& Data Structures	25	75	100
10	III	Core Practical	Practical-2	3	2	C++ and Data Structure lab	25	75	100
11	III	Allied 1	Paper-2	7	6	(to choose any one) 1. Mathematics II 2. Mathematical Foundations II	25	75	100
12	IV	Soft skill		2	1	Soft skill	25	75	100

S.NO.	Part	Study Components		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
		Course Title							
13	IV	Value Education		2	2	Value Education	25	75	100
				30	25		175	525	700
SEMESTER III							CIA	Uni. Exam	Total
14	I	Language	Paper-3	6	4	Tamil / Other Languages	25	75	100
15	II	English	Paper-3	6	4	English	25	75	100
16	III	Core Theory	Paper-3	3	3	Java Programming	25	75	100
17	III	Core Practical	Practical-3	3	3	Java Programming Lab	25	75	100
18	III	Allied II	Paper-3	4	4	(to choose any one) 1. Physics I 2. Statistical Methods and their Applications	25	75	100
19	III	Allied II	Practical	3	0	Physics / Statistics Practical	0	0	0
20	IV	Skill Based Subject I	Paper-1	3	3	Design & Analysis of Algorithm	25	75	100
21	IV	Non-Major Elective I	Paper-1	2	2	Introduction to Information Technology	25	75	100
				30	23		175	525	700
SEMESTER IV							CIA	Uni. Exam	Total
22	I	Language	Paper-4	6	4	Tamil/Other Languages	25	75	100
23	II	English	Paper-4	6	4	English	25	75	100
24	III	Core Theory	Paper-4	3	3	Database Management Systems	25	75	100
25	III	Core Practical	Practical-4	3	3	RDBMS Lab	25	75	100
26	III	Allied II	Paper-4	4	4	(to choose any one) 1. Physics II	25	75	100

S.NO.	Part	Study Components		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
		Course Title							
						2. Statistical Methods and their Applications II			
27	III	Allied Practical	Practical	3	2	Physics / Statistics practicals	25	75	100
28	IV	Skill Based Subject II	Paper-2	3	3	Computer Organisation and Architecture	25	75	100
29	IV	Non-Major Elective II	Paper-2	2	2	Internet and its Applications	25	75	100
				30	25		200	600	800
SEMESTER V							CIA	Uni. Exam	Total
30	III	Core Theory	Paper-5	6	3	Mobile Application Development	25	75	100
31	III	Core Theory	Paper-6	6	3	Operating System	25	75	100
32	III	Core Theory	Paper – 7	4	2	Data Communication & Network	25	75	100
33	III	Core Practical	Practical-5	4	3	Mobile Applications Development - Lab	25	75	100
34	III	Core Practical	Practical-6	4	3	Operating System - Lab	25	75	100
35	III	Elective I	Paper-1	3	3	1. Data Mining 2. Computer Graphics 3. Information Security	25	75	100
36	IV	Skill Based Subject III	Paper-3	3	3	Software Engineering	25	75	100
				30	20		175	525	700
SEMESTER VI							CIA	Uni. Exam	Total
37	III	Core Theory	Paper-8	7	5	Cloud Computing	25	75	100
38	III	Core Theory	Paper-9	6	4	Open Source Programming	25	75	100
39	III	Core	Practical-	4	3	ASP .NET Lab	25	75	100

S.NO.	Part	Study Components		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
		Course Title							
		Practical	7						
40	III	Core Practical	Practical-8	4	3	Open Source Programming - Lab	25	75	100
41	III	Elective II	Paper-2	3	3	1. Software Testing 2. Mobile Computing 3. Microprocessor	25	75	100
42	III	Elective III	Paper-3	3	3	1. Internet of Things 2. System Software 3. Multimedia Systems	25	75	100
43	IV	Skill Based Subject IV	Paper-4	3	3	ASP .NET	25	75	100
44	V	Extension Activities		0	1		100	0	100
				30	25		275	525	800

Part	Subject	Papers	Credit	Total credits	Marks	Total Marks
Part I	Languages	4	4	16	100	400
Part II	English	4	4	16	100	400
Part III	Allied (Odd Semester)	2	4	8	100+100 (I + III SEM)	200
	Allied (Even Semester)	2	6+4	10	100+100 (II + IV SEM)	200
	Allied Practical	1	2	2	100	100
	Electives	3	3	9	100	300
	Core	9	(3-6)	35	100	900
	Core Practical	8	(2-3)	22	100	800
Part IV	Environmental Science	1	2	2	100	100
	Soft skill	1	1	1	100	100
	Value Education	1	2	2	100	100
	Lang. & Others/NME	2	2	4	100	200
	Skill Based	4	3	12	100	400
Part V	Extension	1	1	1	100	100
	Total	43		140		4300

THIRUVALLUVAR UNIVERSITY

B.Sc. COMPUTER SCIENCE

SYLLABUS UNDER CBCS

(with effect from 2017 - 2018)

SEMESTER I

PAPER – 1

Digital Logic & Programming in C

Objective:

Provide basic knowledge on Digital Electronics to understand the working principles of Digital computer and to develop programming skill using C language.

UNIT I: Number systems and Boolean algebra

Number Systems - Decimal, Binary, Octal, Hexadecimal and their inter conversions, - Binary Arithmetic - 1's complement, 2's complement and 9's complement .Binary codes - BCD, Excess-3, Graycode.

Boolean Algebra: Boolean Laws - Simplification of Boolean Functions - Logic gates and Truth Table – Universal Gates (NAND and NOR) - The K-map method up to five variables, don't care conditions, POS & SOP forms.

UNIT-II: Combinational and Sequential Circuits

Combinational Logic: Half/Full adder/subtractor, code conversion, Multiplexers, de multiplexers, encoders, decoders, Combinational design using MUX & DEMUX. BCD adder, magnitude comparator.

Sequential logic: Flip flops (RS, Clocked RS, D, JK, JK Master Slave)-Counters & types Synchronous and Asynchronous counters- Registers, Shift registers and their types.

UNIT –III: C Basics and Control constructs

C fundamentals- Operators- Constants- Expression – Library functions- Decision making and branching- Switch- FOR, WHILE, DO WHILE loops-continue-break

Unit IV: Arrays, Functions and Structures

Arrays-Multi dimensional arrays- User defines functions- Call by Value and reference-Recursion- Storage classes- Structures and Union –Self referential structures

Unit – V: Pointers and Files

Pointers- Pointer operations and Arithmetic- File management in C : File opening and closing- - I/O operations on files - Error handling during I/O operations - Random access to files - Command line arguments

Text Book:

1. Morris Mano M. “**Digital Logic and Computer Design**”, PHI Latest Pub. Ed. (Unit I and 2)
2. Reema Thareja,” **Programming in C** “ Oxford University Press 2014

Reference Book

1. Albert Paul Malvino, Donald P Leach, **Digital principles and applications** TMH, 1996.
2. Balagurusamy,” **Programming in C**” TMH

CORE PRACTICAL – I
PROGRAMMING IN C - LAB

1. Summation of Series: Sin(x) (Compare with built in functions)
2. Summation of Series Cos(x) (Compare with built in functions)
3. Counting the no. of vowels, consonants, words, white spaces in a line of text
4. Reverse a string & check for palindrome without built in string function
5. ${}^n P_r$, ${}^n C_r$ in a single program using function
6. Matrix Addition, subtraction and multiplication
7. Linear Search of a number in an array
8. Sorting an array in ascending and descending order
9. Finding maximum and minimum of list of numbers
10. Call by value and call by reference of functions
11. Employee pay bill using structure
12. Preparing an EB bill using file

ALLIED

1. MATHEMATICS – I

Objectives of the Course:

To Explore the Fundamental Concepts of Mathematics

UNIT-I: ALGEBRA

Partial Fractions - Binomial, Exponential and logarithmic Series (without Proof) - Summation - Simple problems

UNIT-II : THEORY OF EQUATIONS

Polynomial Equations with real Coefficients - Irrational roots - Complex roots- Transformation of equation by increasing or decreasing roots by a constant - Reciprocal equations - Newton's method to find a root approximately - Simple problems.

UNIT-III : MATRICES

Symmetric - Skew-Symmetric - Orthogonal and Unitary matrices - Eigen roots and eigen vectors – Cayley - Hamilton theorem (without proof)-Verification and computation of inverse matrix

UNIT-IV: TRIGONOMETRY

Expansions of $\sin^n \theta$, $\cos^n \theta$, $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ - Expansions of $\sin \theta$, $\cos \theta$, $\tan \theta$ in terms of θ .

UNIT-V: DIFFERENTIAL CALCULUS

Successive differentiation upto third order, Jacobians - Concepts of polar co-ordinates - Curvature and radius of curvature in Cartesian co-ordinates and in polar co-ordinates.

Recommended Text:

P.Duraipandian and S.Udayabaskaran,(1997) *Allied Mathematics*, Vol. I & II.Muhil Publishers, Chennai.

Reference Books:

1. P.Balasubramanian and K.G.Subramanian,(1997) *Ancillary Mathematics*. Vol. I & II. Tata McGraw Hill, New Delhi.
2. S.P.Rajagopalan and R.Sattanathan,(2005) *Allied Mathematics* .Vol. I & II. VikasPublications, New Delhi.
3. P.R.Vittal (2003) *Allied Mathematics* .Marghan Publications, Chennai
4. P.Kandasamy, K.Thilagavathy (2003) *Allied Mathematics* Vol-I, II S.Chand& company Ltd., New Delhi-55.
5. Isaac, *Allied Mathematics*. New Gamma Publishing House, Palayamkottai.

2. MATHEMATICAL FOUNDATIONS - I

Objectives

To know about Logical operators, validity of arguments, set theory and set operations, relations and functions, Binary operations, Binary algebra, Permutations & Combinations, Differentiation, Straight lines, pair of straight lines, Circles, Parabola, Ellipse, Hyperbola.

UNIT-I: SYMBOLIC LOGIC

Proposition, Logical operators, conjunction, disjunction, negation, conditional and bi-conditional operators, converse, Inverse, Contra Positive, logically equivalent, tautology and contradiction. Arguments and validity of arguments.

UNIT-II: SET THEORY

Sets, set operations, venn diagram, Properties of sets, number of elements in a set, Cartesian product, relations & functions,

Relations : Equivalence relation. Equivalence class, Partially and Totally Ordered sets,

Functions: Types of Functions, Composition of Functions.

UNIT-III: BINARY OPERATIONS

Types of Binary Operations: Commutative, Associative, Distributive and identity, Boolean algebra: simple properties. Permutations and Combinations.

UNIT-IV: DIFFERENTIATION

Simple problems using standard limits,

$$\text{Lt } \frac{x^n - a^n}{x - a}, \text{ Lt } \frac{\sin x}{x}, \text{ Lt } \frac{\tan x}{x}, \text{ Lt } \frac{e^x - 1}{x}, \text{ Lt } \frac{(1+1/n)^n - 1}{1/n}, \text{ Lt } \frac{1}{1+n}$$

$\infty \rightarrow 0, 0 \rightarrow \infty, 0 \rightarrow 0, \infty \rightarrow \infty$

Differentiation, successive differentiation, Leibnitz theorem, partial differentiation, Applications of differentiation, Tangent and normal, angle between two curves.

UNIT-V: TWO DIMENSIONAL ANALYTICAL GEOMETRY

Straight Lines - Pair Straight Lines

Text Book.

P.R. Vittal, Mathematical Foundations – Maragham Publication, Chennai.

Reference Books

1. U. Rizwan, Mathematical Foundation - SciTech, Chennai
2. V.Sundaram& Others, Discrete Mathematical Foundation - A.P.Publication, Sirkali.
3. P.Duraipandian& Others, Analytical Geometry 2 Dimension - Emerald publication 1992 Reprint.
4. Manicavachagompillay&Natarajan. Analytical Geometry part I - Two Dimension - S.Viswanathan (printers & publication) Put Ltd., 1991.

SEMESTER II
CORE THEORY PAPER – 2
C++ AND DATA STRUCTURE

Objective: To develop Object oriented programming skills using C++ and to introduce data structure concepts.

UNIT-I: Object Oriented Concepts and C++

C++ Fundamentals - Operators, Expressions and Control Structures: If,If..Else, Switch - Repetitive Statements- for,while,do..while - Input and Output in C++ - manipulators-manipulators with parameters. - Pointers and arrays

UNIT-II: Functions and Classes

Functions in C++ - Main Function - Function Prototyping - Parameters Passing in Functions - Values Return by Functions - inline Functions - Function Overloading. Classes and Objects; Constructors and Destructors; and Operator Overloading - Type of Constructors

UNIT – III: Inheritance, Polymorphism & Files

Inheritance : Single Inheritance - Multilevel inheritance - Multiple inheritance - Hierarchical Inheritance - Hybrid Inheritance - Polymorphism - Working with Files : Classes for File Stream Operations - Opening and Closing a File - End-of-File Detection - Updating a File - Error Handling during File Operations .

UNIT-IV: Fundamental Data Structures

Definition of a Data structure - primitive and composite Data Types, Stacks (Array) - Operations –Linked Stack-Operations- Applications of Stack (Infix to Postfix Conversion).

Queue (Array)- operations-Linked Queue- Operations- - Singly Linked List - Operations, Application of List (Polynomial Addition)-. Doubly Linked List - Operations.

UNIT-V : Trees and Graphs

Trees: Binary Trees –Binary Search Tree- Operations - Recursive Tree Traversals- Recursion. Graph - Definition, Types of Graphs, Graph Traversal –Dijkstras shortest path- DFS and BFS.

Text Books

1. Mastering in C++, K.R.Venugopal, Raj Kumar, T.Ravisankar – McGraw Hill, 2011.
2. C++ Plus Data Structure by Nell Dale, Narosa Publications, 2000

Reference Books:

1. Reema Thareja, Object Oriented Programming with C++, Oxford University Press, 2015
2. Balagurusamy, C++ programming, TMH.
3. Fundamentals of Data Structures in C++ by Ellis Horowitz, Sartaj Sahni and Dinesh Mehtha, Second Edition, University Press
4. Data Structures using C++ by Varsha H.Patil. Oxford University Press, 2012

PRACTICAL – II
C++ & DATA STRUCTURE - LAB

1. Implementing classes, object, constructors and member functions for calculating area and perimeter of a circle.
2. Implementing function overloading (Find area/volume of rectangle, circle, sphere, cylinder, cone etc).
3. Implementing operator over loading(Addition, subtraction, multiplication of matrices)
4. Implementing single, multiple, hierarchical inheritance.
5. Implementing sequential file operations using error handling functions.
6. Implementing PUSH, POP operations of stack using Arrays.
7. Implementing add, delete operations of a queue using Arrays.
8. Implementing Infix to postfix conversion of an expression using stack
9. Implementing Binary search tree recursive traversals (in-order, pre-order, post-order).
10. Implementing Polynomial addition using linked list.

ALLIED - 2

1. MATHEMATICS – II

Objectives of the Course

To Explore the Fundamental Concepts of Mathematics

UNIT-I: Application of Integration

Evaluation of double, triple integrals - Simple applications to area, volume - Fourier series for functions in $(0, 2\pi)$ and $(-\pi, \pi)$.

UNIT-II: Partial Differential Equations

Formation, complete integrals and general integrals - Four standard types, Lagrange's equations.

UNIT-III: Laplace Transforms

Laplace Transformations of standard functions and simple properties - Inverse Laplace transforms - Applications to solutions of linear differential equations of order 1 and 2-simple problems

UNIT-IV: Vector Analysis

Scalar point functions - Vector point functions - Gradient, divergence, curl - Directional derivatives - Unit to normal to a surface.

UNIT-V: Vector Analysis (continued)

Line and surface integrals - Gauss, Stoke's and Green's theorems (without proofs) - Simple problem based on these Theorems.

Recommended Text

P.Duraipandian and S.Udayabaskaran,(1997) *Allied Mathematics*, Vol. I & II.Muhil Publishers, Chennai

Reference Books:

1. P.Balasubramanian and K.G.Subramanian,(1997)*Ancillary Mathematics*. Vol. I & II. Tata McGraw Hill, New Delhi.
2. S.P.Rajagopalan and R.Sattanathan,(2005) *Allied Mathematics* .Vol. I & II.Vikas Publications, New Delhi.
3. P.R.Vittal(2003). *Allied Mathematics* .Marghan Publications, Chennai.
4. P.Kandasamy, K.Thilagavathy (2003) *Allied Mathematics Vol-I, II* S.Chand& company Ltd., New Delhi-55.
5. Isaac, *Allied Mathematics*. New Gamma Publishing House, Palayamkottai

2. MATHEMATICAL FOUNDATIONS II

Objectives

To know about Matrix Operations, Symmetric, Skew-Symmetric, Hermitian, Skew-Hermitian, Orthogonal, Unitary Matrices. Rank of a Matrix Solutions of linear equations Consistency and Inconsistency, Characteristic roots and Characteristics Vectors, Cayley - Hamilton Theorem, Integration of rational functions, Integration by parts, Reduction formulae, Area and volume using integration, Planes, Straight lines, Spheres, Curves, Cylinders.

UNIT-I: MATRICES

Multiplication of matrices, Singular and Non-Singular matrices, Adjoint of a Matrix, Inverse of a matrix Symmetric and Skew-Symmetric, Hermitian and Skew-Hermitian, Orthogonal and unitary matrices, Rank of a matrix, Solution of Simultaneous Linear equations by

- (i) Cramer's rule.
- (ii) Matrix Inversion Method.

UNIT-II: MATRICES

Test for Consistency and Inconsistency of linear equations, (Rank Method), characteristic roots and characteristic vectors, Cayley - Hamilton theorem, matrix of linear transformations: reflection about the x, y axes and the line y=x, rotation about the origin through an angle, expansion or compression, shears, translation.

UNIT-III

Integration Simple problems, integration of rational function involving algebraic expressions of the form

$$\frac{1}{ax^2+bx+c}, \frac{1}{\sqrt{ax^2+bx+c}}, \frac{px+q}{\sqrt{ax^2+bx+c}}, \frac{px+q}{ax^2+bx+c}, \frac{px+q}{\sqrt{ax^2+bx+c}}$$

integrations using simple substitutions integrations involving trigonometric functions of the form

$$\frac{1}{a+b\cos x}, \frac{1}{a^2\sin^2 x + b^2\cos^2 x}, \text{ Integration by parts.}$$

UNIT-IV

Properties of definite integrals. Reduction formulae for

$\int x^n e^{ax} dx$, $\int \sin^n x dx$, $\int \cos^n x dx$, $\int x^m (1-x)^n dx$, applications of integration for (i) Area under plane curves, (ii) Volume of solid of revolution.

UNIT-V: ANALYTICAL GEOMETRY OF THREE DIMENSION

Planes, straight lines.

Text Book.

P.R.Vittal, Mathematical Foundations - Margham Publication, Chennai.

Reference Books

1. U. Rizwan, Mathematical Foundation - SciTech, Chennai
2. V.Sundaram & Others, Discrete Mathematical Foundation - A.P.Publication, Sirkali.
3. P.Duraipandian & Others, Analytical Geometry 3 Dimension - Emerald publication 1992 Reprint.
4. Manicavachagompillay & Natarajan. Analytical Geometry part II - three Dimension - S.Viswanathan (printers & publication) Put Ltd., 1991.

SEMESTER III
CORE THEORY PAPER – 3
JAVA Programming

Objectives:

To improve Object Oriented Programming gathered already through an independent platform.

Unit – I: BASICS, ESSENTIALS, CONTROL STATEMENT AND CLASSES & OBJECTS

Computer and its Languages – Stage, Origin and Features for Java - JDK–OOP; Java Essentials: Program – API - Variables& Literals - Data Types - String Class – Operators - Type conversion - Constants - Scope – Comments - Keyboard Input; Control Statements: Conditional Statements – Looping Statements - Break and Continue Statements; Classes and Objects: Modifiers - Arguments - Constructors - Packages and import - Static Class - Overloaded Methods and Constructors - Returning Objects – to String() - this reference –Enumeration - Garbage Collection.

Unit – II: ARRAYS, INHERITANCE, INTERFACES AND PACKAGES

Arrays - Three or More Dimensions; Inheritance: Basics - Calling the Super class Constructor - Overriding Super class Methods - Inheritance from Subclasses – Polymorphism -Abstract Classes and Methods - Interfaces: Fields - Multiple inheritance - Interface inheritance; Packages: Creating packages – Accessing package from other packages- Access Specifier.

Unit – III: STRING HANDLING, EXCEPTION HANDLING AND MULTI THREADING

String Handling: Basics - Operations –String Methods - String Buffer class - String Builder – to String method -String Tokenizer class. Exception Basics: try and catch block - Multiple catch block - Nested try - throws keyword - Throw vs Throws - Final Vs Finally Vs Finalize - Method Overriding - Custom Exception - Multithreading: Life Cycle - Methods in Thread - thread application – Thread priority – Synchronization - Inter-thread communication - Suspending, Resuming, and Stopping Threads;

Unit – IV: APPLLET AND GUI APPLICATION

Applets: Basis - Lifecycle - Applet classes - Application – Graphics; AWT-I: GUI Programming - AWT classes - Windows fundamentals- Creating Windows - Dialog Boxes - Layout Managers - Radio Buttons and Check Boxes – Borders-Swing

Unit – V: JAVA DATABASE CONNECTIVITY

JDBC - Types of Drivers- Architecture- Classes and Interfaces - Developing JDBC Application - New Database and Table with JDBC - Working with Database Metadata.

Text Book

1. S.Sagayaraj, R.Denis, P.Karthik & D.Gajalakshmi, “Java Programming“, Universities Press, 2017

References

1. Patrick Naughton and Herbert Schildt. “The Complete Reference JAVA 2”. 3rd Edition. Tata McGraw-Hill Edition, 1999.
2. Muthu C. “Programming with JAVA”. 2nd Edition. Vijay Nicole Imprints, 2011.
3. Ken Arnold Gosling and Davis Holmen. “The Java Programming Language”. 3rd Edition. Addition Wesley Publication.

Core Practical

Practical 3- JAVA Programming LAB

List of Practical's

1. Implementing Package, inheritances and interfaces
2. Implementing Flow, Border and Grid Layouts
3. Implementing Dialogs , Menu and Frame
4. Implementing User defined Exception Handling
5. Implementing Multithreading
6. Implementing I/O Stream File handling
7. Implementing a Calculator using Swing
8. CRUD operation Using JDBC
9. Client Server using TCP and UDP Socket
- 10. GUI application with JDBC**

ALLIED - 3

1. PHYSICS - I

UNIT – I: PROPERTIES OF MATTER

Elasticity : Hooke's Law – Elastic Constants – bending of beam – Bending moment – Cantilever Depression at the loaded end of a cantilever – determination of Young's modulus by non-uniform bending.

Torsion : Torsion couple – Potential energy in a twisted wire – Torsional pendulum – Time period – Determination of rigidity modulus by Torsional oscillation (without masses).

Viscosity: Viscosity of a liquid – Viscous force – Co-efficient of viscosity of a liquid – Poiseuille's formula .

Surface Tension: Surface Tension – Surface Tension and interfacial surface tension by the method of drops.

UNIT – II: HEAT

Heat: Specific heat – Newton's law of cooling – determination of specific heat of a liquid using Newton's law of cooling – Emissivity and Emissive Power.

Low Temperature: J.K. Effect – Positive Effect – Negative Effect – Temperature of Inversion – Super conductors. Type I and II – Meisner Effect – Helium I and II.

UNIT – III: ELECTRICITY AND MAGNETISM

Electricity: Potentiometer – Principle – Calibration of low range voltmeter – Measurement of internal resistance of cell – measurement of an unknown resistance.

Magnetism – Moment and pole strength of a magnet – Deflection magnetometer – Tan C position – Vibration magnetometer – Theory – Period of Oscillation – Determination of M and B_H using the deflection magnetometer in Tan C position and the vibration magnetometer.

UNIT – IV: SOUND AND ACOUSTICS OF BUILDING

Sound: Transverse vibration of strings – Velocity and frequency of vibrations of a stretched string – laws – sonometer – A.C. Frequency – Steel Wire – Brass wire.

Ultrasonics – Production by Piezo – electric method – properties and uses.

Acoustics of buildings: Reverberation – Reverberation time – Sabine's formula (definition only) – Sound absorption co-efficient of surface – conditions for the perfect acoustics.

UNIT – V: OPTICS

Interference: Air Wedge – Description – Test for optical flatness of glass plate – Determination of diameter of a thin wire by air wedge.

Diffraction: Theory of transmission grating – Normal Incidence – Determination of Wavelength of monochromatic source and Wavelength of mercury line using a grating by normal Incidence.

Fibre optics: principle-classification of optical fibres-fibre optic communication system block diagram.

Books for Study & Reference

1. Allied Physics – R. Murugesan S. Chand & Co. First Edition (2005).
2. Allied Physics – Dr. K. Thangaraj, Dr. D. Jayaraman Popular Book Department, Chennai.
3. Allied Physics – Prof. Dhanalakshmi and others.
4. Elements of Properties of Matter – D.S. Mathur, S. Chand & Co. (1999).
5. Heat and Thermodynamics – N. Brijlal and Subramaniam S. Chand & Co.
6. A text book of Sound – by M. Narayanamoorthy and other National Publishing Companies (1986).
7. Modern Physics – R. Murugesan S. Chand & Co. (2004).
8. Introduction to Fibre optics- K.Thyagarajan and Ajay Ghatak,Cambridge,University Press(1999).

ALLIED

2. STATISTICAL METHODS AND THEIR APPLICATIONS I

Objective

To understand and computing statistical Methods by which to develop the programming Skills.

UNIT-I

Introduction - scope and limitations of statistical methods - classification of data - Tabulation of data - Diagrammatic and Graphical representation of data - Graphical determination of Quartiles ,Deciles and Percentiles.

UNIT-II

Measures of location : Arithmetic mean, median, mode, geometric mean and Harmonic mean and their properties.

UNIT-III

Measures of dispersion : Range, Quartile deviation, mean deviation, Standard deviation, combined Standard deviation, and their relative measures.

UNIT-IV

Measures of Skewness Karl Pearson's, Bowley's, and kelly's and co-efficient of Skewness and kurtosis based on moments.

UNIT-V

Correlation - Karl Pearson - Spearman's Rank correlation - concurrent deviation methods.

Regression Analysis: Simple Regression Equations.

Note : The proportion between theory and problems shall be 20:80

Books for Reference:

1. Fundamental of Mathematical Statistics - S.C. Gupta & V.K. Kapoor - Sultan Chand
2. Statistical Methods - Snedecor G.W. & Cochran W.G. oxford & +DII
3. Elements of Statistics - Mode . E.B. - Prentice Hall
4. Statistical Methods - Dr. S.P. Gupta - Sultan Chand & Sons

Skill Based Subject –Paper 1

DESIGN AND ANALYSIS OF ALGORITHMS

Objective: To build a solid foundation of the most important fundamental subject in computer science. Creative thinking is essential to algorithm design and mathematical acumen and programming skills.

UNIT -I: ALGORITHM AND ANALYSIS

What is an Algorithm? - Algorithm Specification- Performance Analysis- Randomized Algorithms.

UNIT - II: DIVIDE AND CONQUER

General Method - Binary Search - Finding the Maximum and Minimum-Merge Sort - Quick Sort - Selection Sort- Strassen's Matrix Multiplications.

UNIT - III: THE GREEDY METHOD

The General Method - Knapsack Problem – Tree Vertex Splitting - Job Sequencing with Deadlines - Minimum Cost Spanning Trees - Optimal Storage on Tapes - Optimal Merge Pattern - Single Source Shortest Paths.

UNIT - IV: DYNAMIC PROGRAMMING

The General Method – Multistage Graphs - All pair shortest path - String Editing - 0/1 Knapsack – Reliability Design - The Traveling Salesperson Problem

UNIT - V: TRAVERSAL, SEARCHING & BACKTRACKING

Techniques for Binary Trees- Techniques for Graphs - The General Method - The 8-Queens Problem – Sum of Subsets- Graph Colouring- Hamiltonian Cycles

TEXT BOOK

Fundamentals of Computer Algorithms, Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, Galgotia Publications, 2015.

REFERENCE BOOKS:

1. Introduction to Algorithms, Cormen T.H., Leiserson C.E. and Rivest R.L., PHI 1998.
2. Introduction to the Design and Analysis of Algorithms, Anany Levitin, Pearson Education, 2nd Edition.

Non- Major Elective-1 Paper-1

Introduction to Information Technology

Objectives:

To enable the student to be proficient with Information Technology with a better knowledge of Computer

UNIT – I Introduction to Computers:

Definition - Characteristics of a Computer - Classification of Computers - Basic Anatomy of the Computer - Applications / Uses of Computers in different fields

UNIT – II Input and Output Devices:

Input Devices - Output Devices - Data Representation - Programming Languages / Computer Languages - Software: System Software - Application Software

UNIT – III Data Communication and Computer Networks:

Data Communication - Computer Network - The Uses of a Network - Types of Networks - Network Topologies- Transmission Media: Guided Transmission Media - Wireless Transmission

UNIT – IV Internet and its Applications:

History of Internet - Uses of Internet - Advantages of Internet - ISP - Internet Services - IP Address - Web Browser - URL - DNS - Internet Explorer - Types of internet connections - E-mail - Search Engine.

UNIT – V Operating System:

Evolution of operating systems - Function of Operating System - Classification of Operating –System - Example of Operating System – DOS –Windows – UNIX - Linux

TEXT BOOKS:

1. Alexis Leon and Mathews Leon, “Fundamentals of Information Technology”, Vikas Publishing House Pvt. Ltd.
2. Introduction to Information Technology, P.Rizwan Ahmed, Second Edition, Margham Publications, 2016
3. Introduction to Information Technology, PelinAksoy, Laura DeNardis, Cengage Learning India Private Limited.

SEMESTER IV
CORE THEORY PAPER – 4
DATABASE MANAGEMENT SYSTEM

Objective: To incorporate a strong knowledge on databases to students

UNIT - I Database Basics

Introduction: Flat File – Database System – Database – Actionable for DBA. The Entity – Relationship Model: Introduction – The Entity Relationship Model. Data Models: Introduction – Relational Approach – The Hierarchical Approach – The Network Approach.

UNIT – II Relational Algebra

Structure of Relational Databases – Fundamental Relational Algebra Operations – Additional Relational Algebra Operations - Extended Relational Algebra Operations - Null Values - Modification of the Database - The Tuple Relational Calculus – The Domain Relational Calculus

UNIT – III Normalization

Normalization: Introduction - Normalization – Definition of Functional Dependence (FD) – Normal Forms: 1NF, 2NF, 3NF and BCNF.

UNIT – IV Structured Query Language

Structured Query Language: Features of SQL – Select SQL Operations – Grouping the Output of the Query – Querying from Multiple Tables – Retrieval Using Set operators – Nested Queries. T-SQL – Triggers and Dynamic Execution: Transact-SQL..

UNIT – V Procedural Language

Procedural Language- SQL: PL/SQL Block Structure – PL/SQL Tables. Cursor Management and Advanced PL/SQL: Opening and Closing a Cursor – Processing Explicit Cursor – Implicit Cursor – Exception Handlers – Sub Programs in PL/SQL – Functions – Precaution While Using PL/SQL Functions – Stored Procedure – Object Oriented Technology.

Text Book

1. Rajesh Narang, “Database Management Systems”, PHI Learning Private Limited, New Delhi, sixth printing, 2010.

Reference

1. S.K. Singh, “Database Systems – Concepts, Design and Applications”, Dorling Kindersley (India) Pvt. Ltd., Second Impression, 2008
2. Database System Concepts , Abraham Silberchatz, Henry F Korth , S.Sudarshan, McGraw-Hill - 5th Edition - 2006.

Core Practical

Practical 4- RDBMS LAB

1. Table creation and simple Queries
2. Queries using Aggregate Function and Set Operations
3. Table creation with various Joins
4. Nested Sub queries and correlated Sub queries
5. View creation and manipulation
6. PL/SQL program for cursor
7. PL/SQL program for packages
8. PL/SQL program for triggers and its type
9. PL/SQL program for procedures and functions

ALLIED - 2

1. PHYSICS II

UNIT – I: WAVE MECHANICS

Wave Mechanics – De Broglie Waves – Dual Nature – Experimental Study of Matter Waves – Davission and Germer's Experiment – G.P. Thomson's Experiment – Heisenberg's uncertainty Principle – The position and moment of a particle.

UNIT – II : NUCLEAR PHYSICS

Particle accelerators – cyclotron, particle detectors – GM Counter Artificial Transmutation – Rutherford's Experiment – The Q value equation for nuclear reaction – Threshold energy – Nuclear Reactions.

Conservation Laws: Conservation of Charge – Conservation of Nucleons – Conservation of Mass – Energy – Conservation of Parity – Quantities conserved and quantities not conserved in a nuclear reaction.

UNIT – III : ENERGY PHYSICS

Sources of conventional energy – Need for non-conventional energy resources – solar energy utilization – solar water heater – solar drier – conversion of light into electrical energy – solar cell – merits and demerits of solar energy – wind energy – its conversion systems – energy from Bio mass – Bio gas generation – Industrial and space application.

UNIT – IV: CRYSTALLOGRAPHY

Crystallography : The crystal structure – Unit Cell –Bravais lattice- structures of simple cubic-BCC and FCC- coordination number, packing factor calculation for the above structures –Hexagonal closed packed(HCP) structure -Miller indices – concept of Reciprocal Vectors.

UNIT – V: ELECTRONICS

Electronics: Transistor characteristics in common base and common emitter mode- Transistor single stage amplifier- Expression for input impedance, output impedance and current gain.

Digital Electronics : NAND and NOR as universal building blocks- De Morgan's theorem –statement and proof- Fabrication of diodes and transistors using Monolithic technology–limitations.

Books for Study & Reference

1. Allied Physics – R. Murugesan S. Chand & Co. First Edition (2005).
2. Allied Physics – Dr. K. Thangaraj, Dr. D. Jayaraman Popular Book Department, Chennai.
3. Allied Physics – Prof. Dhanalakshmi and others.
4. Elements of Properties of Matter – D.S. Mathur, S. Chand & Co. (1999).
5. Heat and Thermodynamics – N. Brijlal and Subramaniam S. Chand & Co.
6. A text book of Sound – by M. Narayanamoorthy and other National Publishing Companies (1986).
7. Modern Physics – R. Murugesan S. Chand & Co. (2004).
8. Electronic Principles and Applications – A.B. Bhattacharya, New Central Book Agency, Calcutta.
9. Introduction to Solid State Physics – C. Kittel, 5th Edition Wiley Eastern Ltd.
10. Renewable & Sustainable energy sources – Agarwal.

ALLIED

2. STATISTICAL METHODS AND THEIR APPLICATIONS II

Objective

To understand and computing statistical Methods by which to develop the programming Skills.

UNIT-I

Curve fitting by the methods of least squares -
 $Y = a x + b$, $Y = a x^2 + b x + c$, $Y = a x^b$, $Y = a e^{bx}$

UNIT-II

Sample Space - events - probability - Addition and Multiplication Theorem - conditional probability -Baye's Theorem. Mathematical expectation Addition and Multiplication theorem, Chebychev's Inequality.

UNIT-III

Standard distributions - Binomial, Poisson, Normal distribution and fitting of these distributions.

UNIT-IV

Test of Significance- small sample and large sample test based on mean, S.D. correlation and proportion - confidence interval.

UNIT-V

Analysis of variance - One and Two way classifications - Basic principle of design of Experiments - Randomisation, Replication and Local control - C.R.D., R.B.D. and L.S.D.

Books for Reference:

1. Fundamental of Mathematical Statistics - S.C. Gupta & V.K. Kapoor - Sultan Chand
2. Fundamental of Applied Statistics - S.C. Gupta & V.K. Kapoor – Sultan Chand
3. Statistical Methods - Snedecor G.W. & Cochran W.G. oxford & +DII
4. Elements of Statistics - Mode . E.B. – Prentice Hall

ALLIED PRACTICAL

1. PHYSICS

(Any 15 Experiments)

1. Young's modulus – non uniform bending – pin and microscope.
2. Rigidity modulus – Static Torsion Method Using Scale and Telescope.
3. Rigidity modulus – Torsional oscillation method (without symmetric masses).
4. Determination of Co-efficient of Viscosity – Graduated Burette.
5. Surface Tension and Interfacial Tension – By drop weight method.
6. Specific Heat Capacity of a liquid – by Newton's Law of Cooling.
7. Sonometer – Determining A.C. Frequency. (Screw Gauge is given).
8. Sonometer – frequency of tuning fork.
9. Newton's Rings – Radius of Curvature.
10. Air Wedge – Determination of thickness of thin wire.
11. Spectrometer Grating – Minimum Deviation – Mercury Lines.
12. Spectrometer – Refractive Index of a liquid – Hollow Prism.
13. Potentiometer – Calibration of High Range Ammeter.
14. Potentiometer – Calibration of Low Range Voltmeter.
15. Determination of M and B_H using Deflection Magnetometer in Tan C position and vibration magnetometer.
16. Figure of merit and voltage sensitiveness of table galvanometer.
17. Construction of AND, OR gates using diodes and NOT by transistors.
18. Zener diode – Voltage Regulation.
19. NAND / NOR as universal gate.
20. Demorgan's theorem verification.

ALLIED PRACTICAL

2. STATISTICAL METHODS AND THEIR APPLICATIONS - Practical

ALLIED PRACTICAL

1. Formation of uni-variate and bi-variate frequency distribution
2. Diagrams and Graphs
3. Measures of Location
4. Measures of Dispersion
5. Skewness and Kurtosis
6. Correlation and Regression
7. Curve Fitting : $y = ax+b$, $y=ax^2+bx+c$, $y=ax^b$, $y=ae^{bx}$
8. Fitting of distributions - Binomial, Poisson, Normal
9. Test of significance small sample and large sample tests
10. Analysis of Variance: one way classification, Two way classification and Design of Experiments - C.R.D, R.B.D & L.S.D

BOOKS FOR REFERENCE:

1. Statistical Methods by S.P. Gupta, Sultan chand & Sons
2. Fundamental of Applied Statistics - S.C. Gupta & V.K. Kapoor

Note:

Use of Scientific Calculator shall be permitted for Practical Examination. Statistical Table may be provided to the students at the Examination Hall.

Skill Based Subject II –Paper 2
Computer Organisation and Architecture

Objective: To enable the student to have a better understanding of architecture of computer and prepare the student for higher level of programming

UNIT - I

Instruction Codes – Computer Registers – Computer Instructions – Timing and Control – Instruction Cycle – Memory Reference Instructions – Input-Output and Interrupts.

UNIT - II

Control Memory – Address Sequencing – Micro program Examples – Design of Control Unit.

UNIT - III

Introduction – General Register Organization – Instruction Formats – Addressing Modes.

UNIT – IV

Peripheral Devices – I/O interface – Asynchronous Data Transfer – Modes of Transfer - Direct Memory Access – Input Output Processor (Excluding IBM and Intel IOPs).

UNIT - V

Auxiliary Memory – Main Memory – Auxiliary Memory - Associative Memory – Cache Memory -Virtual Memory.

TEXT BOOK

1. Morris Mano M. Computer System Architecture. New Delhi :Prentice Hall of India Private Limited, 2011

REFERENCES

1. William Stallings . Computer Organization and Architecture. 8th edition. Pearson publication, 2010
2. Morris Mano. Digital Logic and Computer Design. New Delhi :Prentice Hall of India Private Limited, 2001

NON MAJOR ELECTIVE II PAPER II

INTERNET AND ITS APPLICATIONS

Objective: To equip students to basics of Internet usage and prepare them for digital world

UNIT - I Internet Basics

Introduction to Computers Programming Language types History of Internet
Personal computers History of World Wide Web- Micro software .NET Java-Web
resources.

UNIT - II Web Browsers

Web Browsers - Internet Explorer - connecting to Internet Features of Internet
explorer6 Searching the Internet- online help and tutorials - File Transmission Protocol
(FTP) Browser settings.

UNIT - III E-Mail

Attaching a file, Electronic mail creating an E-mail id sending and Receiving
mails - attaching a file - Instance messaging - other web browsers.

UNIT - IV HTML

Introduction to HTML headers – Linking - Images-special characters and line
breaks unordered lists- simple HTML programs.

UNIT - V Digital Cash

E-marketing consumer tracking Electronic advertising search engine – CRM -
credit card payments Digital cash and e-wallets micro payments- smart card

Text book

Internet and World Wide Web Third edition H.M.Deitel, P.J. Deitel and
A.B.Goldberg - PHI Reference

The Internet- Complete Reference Harley hahn, Tata McGraw Hill

SEMESTER V

CORE THEORY PAPER – 5

MOBILE APPLICATIONS DEVELOPMENT

Objective:

This course aims to provide the students with a detailed knowledge on Mobile Application and Development and covers Android programming from fundamentals to building mobile applications for smart gadgets.

UNIT I Introduction to Mobile Applications:

Native and web applications - Mobile operating systems and applications - Mobile Databases. Android: History of Android - Android Features – OSS – OHA - Android Versions and compatibility - Android devices - Prerequisites to learn Android – Setting up software – IDE - XML. Android Architecture: Android Stack - Linux Kernel - Android Runtime - Dalvik VM - Application Framework - Android emulator - Android applications.

UNIT II Android development:

Java - Android Studio – Eclipse – Virtualization – APIs and Android tools – Debugging with DDMS – Android File system – Working with emulator and smart devices - A Basic Android Application - Deployment. Android Activities: The Activity Lifecycle – Lifecycle methods – Creating Activity. Intents – Intent Filters – Activity stack.

UNIT III Android Services:

Simple services – Binding and Querying the service – Executing services.- Broadcast Receivers: Creating and managing receivers – Receiver intents – ordered broadcasts. Content Providers: Creating and using content providers – Content resolver. Working with databases: SQLite – coding for SQLite using Android – Sample database applications – Data analysis.

UNIT IV Android User Interface:

Android Layouts – Attributes – Layout styles - Linear – Relative – Table – Grid – Frame. Menus: Option menu – context menu - pop-up menu – Lists and Notifications: creation and display. Input Controls: Buttons-Text Fields-Checkboxes-alert dialogs-Spinners-rating bar-progress bar.

UNIT V Publishing and Internationalizing mobile applications :

Live mobile application development: Game, Clock, Calendar, Converter, Phone book. App Deployment and Testing: Doodlz app – Tip calculator app – Weather viewer app.

Text Books

Barry Burd, “Android Application Development – All-in-one for Dummies”, 2nd Edition, Wiley India, 2016.

Reference:

1. Paul Deitel, Harvey Deitel, Alexander Wald, “ Android 6 for Programmers – An App-driven Approach”, 3rd edition, Pearson education, 2016.
2. Jerome (J. F) DiMarzio, “Android – A Programmer’s Guide”, McGraw Hill Education, 8th reprint, 2015.
3. <http://www.developer.android.com>

OPERATING SYSTEM

Objective: Enable the student to get sufficient knowledge on various system resources.

Unit – I Operating System Basics

Basic Concepts of Operating System - Services of Operating System-Classification of Operating System- Architecture and Design of an Operating System-Process Management -Introduction to Process-Process State -PCB - Process Scheduling - Interprocess Communication

Unit –II Operating System Scheduling

CPU Scheduling: Introduction - Types of CPU Scheduler - Scheduling Criteria - Scheduling Algorithms - FCFS Scheduling – SJF Scheduling;-Priority Scheduling - Round-Robin Scheduling- Multilevel Queue Scheduling - Deadlock - Basic Concept of Deadlock- Deadlock Prevention - Deadlock Avoidance- Deadlock - Detection and Recovery

Unit- III Memory management

Memory Management - Basic Concept of Memory - Address Binding; Logical and Physical Address Space- Memory Partitioning - Memory Allocation-Protection-Fragmentation and Compaction

Unit – IV Swapping

Swapping- Using Bitmaps - Using Linked Lists- Paging-Mapping of Pages to Frames - Hierarchical Page Tables- Segmentation - Virtual Memory - Basic Concept of Virtual Memory- Demand Paging - Transaction Look aside Buffer (TLB) - Inverted Page Table- Page Replacement Algorithms

Unit –V File Management

File Management - Basic Concept of File-Directory Structure-File Protection-Allocation Methods – Various Disk Scheduling algorithms

Text Books:

Abraham Silberschatz Peter B. Galvin, G. Gagne, “Operating System Concepts”, Sixth Edition, Addison Wesley Publishing Co., 2003.

Reference

1. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson
2. Willam-Stalling “Operating System” Fourth Edition, Pearson Education, 2003.

CORE THEORY PAPER – 7

DATA COMMUNICATION & NETWORKS

Objective:

To equip students to basics of Data Communication and prepare them for better computer networking

UNIT I

Introductory Concepts - Network hardware - Network software – Network Architecture - Physical layer - Guided transmission media - Cable television.

UNIT II

Data Link Layer - Design issues - Channel allocation problem - Multiple access protocols - Ethernet - Wireless LAN - 802.11 architecture.

UNIT III

Network Layer : Design issues, Routing Algorithms, Shortest path routing, Flooding, Broadcast & Multicast routing congestion, Control & internetworking.

UNIT IV

Transport Layer - Transport service - Elements of transport protocols - User Datagram Protocol - Transmission Control Protocol.

UNIT V

Application Layer - DNS - Electronic mail - World Wide Web - Multimedia - Network security.

TEXT BOOK

1. Tannenbaum, A.S., 2003 : Computer Networks, Prentice Hall.

REFERENCES

1. Stallings, William, 2008: Local and Metropolution Area Networks: An Introduction, Macmillian Publishing Co.
2. Black: Data Network, Prentice Hall of India.
3. W. Stallings, "Data and Computer Communication", Pearson Education, Fifth Edition, 2001

Mobile Applications Development – Lab

1. Intent and Activity
2. Using Controls
3. Alert Dialogs
4. List View
5. Options Menu
6. Seek Bars
7. Shared Preferences
8. Status Bar Notifications
9. Tab Widgets Talking Clock.
10. Tween Animation
11. Grid View
12. Internal Storage - Files
13. SQLite - Database
14. Google Map
15. Permissions

Core Practical – 6
Operating System Lab

1. Implementing the Process system calls.
2. Implementing I/O system calls.
3. Implementing IPC using message queues.
4. Implementing CPU & scheduling algorithm for first come first serve scheduling.
5. Implementing CPU scheduling algorithm for shortest job first scheduling.
6. Implementing perform priority scheduling.
7. Implementing CPU scheduling for Round Robin Scheduling.
8. Implementing pipe processing.
9. Implementing first fit, best fit algorithm for memory management.
10. A program to simulate producer-consumer problem using semaphores.
11. A Shell Program to find factorial of a given number
12. A shell program to generate Fibonacci number

Elective – 1 Paper – 1

A. DATA MINING

Objective: Enable the student to get sufficient knowledge on various system resources.

UNIT - I: Data Mining Basics

Introduction: Definition of data mining - data mining vs. query tools - machine learning - steps in data mining process - overview of data mining techniques.

UNIT - II: Data Models

Multidimensional Data Model - Data Cube - Dimension Modeling - OLAP Operations - Meta Data - Types of Meta Data.

UNIT - III: Data Editing

Data Pre-Processing and Characterization: Data Cleaning - Data Integration and Transformation - Data Reduction - Data Mining Query Language - Generalization - Summarization - Association Rule Mining

UNIT - IV: Classification

Classification: Classification - Decision Tree Induction - Bayesian Classification - Prediction - Back Propagation - Cluster Analysis - Hierarchical Method - Density Based Method - Grid Based Method - Outlier Analysis.

UNIT - V: Analysis

Cluster analysis: Types of data - Clustering Methods - Partitioning methods - Model based clustering methods - outlier analysis. Advanced topics: Web Mining - Web Content Mining - Structure and Usage Mining - Spatial Mining - Time Series and Sequence Mining.

TEXT BOOKS:

1. PaulrajPonnaiah, “Data Warehousing Fundamentals”, Wiley Publishers, 2001.
2. Jiawei Han, MichelineKamber, “Data Mining: Concepts and Techniques”,Morgan Kaufman Publishers, 2006.

REFERENCES:

1. Usama M. Fayyad, Gregory Piatetsky Shapiro, Padhrai Smyth Ramasamy Uthurusamy, "Advances in Knowledge Discover and Data Mining", the M.I.T. Press, 2007.
2. Ralph Kimball, Margy Ross, The Data Warehouse Toolkit, John Wiley and Sons Inc., 2002
3. Alex Berson, Stephen Smith, Kurt Thearling, "Building Data Mining Applications for CRM", Tata McGraw Hill, 2000.
4. Margaret Dunham, "Data Mining: Introductory and Advanced Topics", Prentice Hall, 2002.
5. Daniel T. Larose John Wiley & Sons, Hoboken, "Discovering Knowledge in Data: An Introduction to Data Mining", New Jersey, 2004

B. COMPUTER GRAPHICS

Objectives: To equip students to basics of computer drawing and prepare them for computer modelling of objects

UNIT – I : OVERVIEW OF GRAPHICS SYSTEMS AND OUTPUT PRIMITIVES

Video Display Devices- Raster Scan System- Random Scan Systems- Hard Copy Deices- Graphic Software- Line Drawing Algorithms: DDA- Bresenham's Line -Circle Generating Algorithms

UNIT – II : ATTRIBUTES AND TWO DIMESIONAL TRANSFORMATIONS

Line Attributes- Curve Attributes-Color And Gray Scale Level- Area Fill Attributes- Character Attributes- Inquiry Functions- Basic Transformations - Composite Transformation – Other transformation

UNIT – III : TWO DIMENSIONAL VIEWING AND CLIPPING

The Viewing Pipeline- Window To Viewport Transformation –Clipping Operations- Point Clipping- Line Clipping: Cohen Sutherland- Liang Barsky-Sutherland Hodgeman Polygon Clipping- Text Clipping- Exterior Clipping- Logical Classification Of Input Devices- Interactive Picture Construction

UNIT – IV : THREE DIMENSION TRANSFORMATION, VIEWING AND CLIPPING

Translation-Rotation-Scaling-Viewing Pipeline- Viewing Coordinates- Projections -View Volumes and General Projection Transformation- Clipping -

UNIT – V : VISIBLE SURFACE DETECTION METHODS

Classification of Visible Surface Detection Algorithms - Back Face Detection - Depth Buffer Method - A Buffer Method - Scan Line Method - Depth Sorting Method- BSP Tree Method -Area Sub Division Method - Octree Methods - Ray Casting Method

TEXT BOOK:

Computer Graphics(C version) , Donald Hearn and M.Pauline Baker, Pearson- 2nd Edit. 2012.

REFERENCE BOOKS:

1. Interactive Computer Graphics–A top down approach using Open GL, Edward Angel , Pearson, 5th Edition.
2. Computer Graphics, Peter Shirley, Steve Marschner, Cengage Learning, Indian Edition,2009

C. INFORMATION SECURITY

Objective: To enable the student to understand various methodology available for securing information

UNIT I Information Security Basics

INTRODUCTION -History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT II Security Investigation

SECURITY INVESTIGATION - Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III Security Analysis

SECURITY ANALYSIS-Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV Security Models

LOGICAL DESIGN-Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V Security Physical Design

PHYSICAL DESIGN-Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel.

Text Book

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003

Reference

1. Micki Krause, Harold F. Tipton, " Handbook of Information Security Management", Vol 1-3 CRC Press LLC, 2004.
2. Stuart McClure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003
3. Matt Bishop, "Computer Security Art and Science", Pearson/PHI, 2002.

Skill Based Subject 3 Paper – 3

SOFTWARE ENGINEERING

Objective:

This course introduces the concepts and methods required for the construction of large software intensive systems.

UNIT-I:

Introduction - Evolving Role of Software - Changing Nature of Software – Software Myths; A Generic View of Process: Layered Technology - Process Models: Waterfall Model - Evolutionary Process Models.

UNIT-II:

Requirements Engineering: Tasks - Initiating the Requirements Engineering Process - Eliciting Requirements - Building the Analysis Model - Requirements Analysis - Data Modelling Concepts.

UNIT-III:

Data Engineering: Design Process and Design Quality - Design Concepts - The Design Model Creating an Architectural Design: Software Architecture - Data Design - Architectural Design - Mapping Data Flow into Software Architecture; Performing User Interface Design: Golden Rules.

UNIT-IV:

Testing Strategies: Strategic Approach to Software Testing- Test Strategies for Conventional and Object Oriented Software - Validation Testing - System Testing -Art of Debugging. Testing Tactics: Fundamentals - White Box- Basis Path - Control Structure - Black Box Testing Methods

UNIT-V:

Project Management: Management Spectrum - People - Product - Process - Project. Estimation: Project Planning Process - Resources - Software Project Estimation - Project Scheduling - Quality Concepts - Software Quality Assurance - Formal Technical Reviews.

TEXT BOOK:

Roger S Pressman, "Software Engineering - A Practitioner's Approach", Sixth Edition, McGraw Hill International Edition, New York: 2005.

REFERENCES:

1. Ian Sommerville, "Software Engineering", 7th Edition, Pearson Education, 2006.
2. Mall Rajib, "Software Engineering", 2/E, PHI, 2006.

SEMESTER VI

CORE THEORY PAPER – 8

CLOUD COMPUTING

Objective:

To enable the students to learn the basic functions, principles and concepts of cloud Systems.

UNIT I: UNDERSTANDING CLOUD COMPUTING

Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Cloud Services.

UNIT II: DEVELOPING CLOUD SERVICES

Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds.

UNIT III: CLOUD COMPUTING FOR EVERYONE

Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events.

UNIT IV: PROGRAMMING MODEL

Parallel and Distributed Programming Paradigms – Map Reduce, Twister and Iterative Map Reduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - Cloud Software Environments -Eucalyptus, Open Nebula, Open Stack, Aneka, CloudSim.

UNIT V: SECURITY IN THE CLOUD

Security Overview - Cloud Security Challenges and Risks - Software-as-a-Service Security- Security Governance - Risk Management - Security Monitoring - Security Architecture Design - Data Security - Application Security - Virtual Machine Security - Identity Management and Access Control - Autonomic Security.

TEXT BOOK:

1. Michael Miller, “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online”, Que Publishing, August 2008.

REFERENCES:

1. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, “Distributed and Cloud Computing, From Parallel Processing to the Internet of Things”, Morgan Kaufmann Publishers, 2012.
2. John W.Rittinghouse and James F.Ransome, “Cloud Computing: Implementation, Management, and Security”, CRC Press, 2010.
3. Toby Velte, Anthony Velte, Robert Elsenpeter, “Cloud Computing, A Practical Approach”, TMH, 2009.
4. Kumar Saurabh, “Cloud Computing – insights into New-Era Infrastructure”, Wiley India, 2011.
5. George Reese, “Cloud Application Architectures: Building Applications and Infrastructure in the Cloud” O'Reilly

CORE THEORY PAPER – 9

OPEN SOURCE PROGRAMMING

Objective:

To discuss techniques that can be effectively applied in practice about HTML5, JavaScript, PHP, CSS and Linux

UNIT I: INTRODUCTION TO HTML 5, JAVA SCRIPT, PHP AND CSS

Introduction to Dynamic Web content- HTTP and HTML- Request and Response Procedure- The Benefits of PHP, JAVA Script, CSS, and HTML5- Introduction to HTML5- The Canvas -The HTML5 Canvas- HTML5 Audio and Video- Introduction to CSS- CSS Rules-Style Types- CSS Selectors- CSS Colors.

UNIT-II: LINUX

Introduction : Linux Essential Commands – File system Concept – Standard Files – The Linux Security Model – Vi Editor – Partitions Creation – Shell Introduction – String Processing – Investigation and Managing Processes – Network Clients – Installing Application.

UNI- III: MYSQL

Introduction to MY SQL – The show Databases and Table – The USE command – Create Database and Tables – Describe Table – Select, Insert, Update, and Delete statement – Some Administrative detail – Table Joins – Loading and Dumping a Database.

UNIT-IV: PHP

PHP Introduction – General Syntactic Characteristics – PHP Scripting – Commenting your code – Primitives, Operations and Expressions – PHP Variables – Operations and Expressions Control -statement – Array – Functions.

UNIT – V PHP

Basic Form Processing – File and Folder Access – Cooking – Sessions – Database Access with PHP – MySQL - MySQL Functions – Inserting Records – Selecting Records – Deleting Records – Update Records.

Text Books

1. “Learning PHP, MySQL, Java Script, CSS and HTML5”, Robin Nixon, O’Reilly Publications, 3rd Edition, 2014.
2. Steven Holzner, “HTML Black Book”, Dreamtech Press &Paraglyph Press Publishers, 2007

Reference Books

Open Source Software, P.Rizwan Ahmed, Margham Publication, Chennai, 2015

Core Practical
PRACTICAL – VII
ASP.NET Lab

1. Implement Validation Controls
2. Write a Program to implement ad rotator control
3. Write a Program to implement state management techniques
4. Write a Program to implement view State and Session State.
5. Write a Program to displaying data with the grid view
6. Write a Program to implement ASP.Net Server Side Controls.
7. Write a Program to implement ASP.Net Master Pages, Themes and Skins.
8. Write a Program working with forms using ASP.Net
9. Write a Program working with pages using ASP.Net.
10. Write a Program to access data sources through ADO.NET

Core Practical
PRACTICAL – VIII
Open Source Programming Lab

1. Create a web page with Frames and Tables.
2. Create a web page incorporating CSS (Cascading Style Sheets)
3. Write a shell program to find the factorial of an integer positive number
4. Write a shell program for checking whether a given string is a palindrome or not.
5. Create a simple calculator in Java script.
6. Write a JavaScript program to scroll your name in the scroll bar.
7. Develop a program and check message passing mechanism between pages.
8. Develop a program and check file system functions, date &time functions.
9. Create a student database table in MYSQL and manipulate records (insert, delete, update) records in a web browser.
10. Develop a program using cookies and session.

Elective II PAPER – 2

(A) SOFTWARE TESTING

Objective: To make the student more proficient with error free software development

UNIT-I PRINCIPLES OF TESTING

A test in time - The cat and the saint - Test the tests first - The Policemen on the bridge - Phase of software project - Quality, Quality Assurance and Quality Control - Testing, Verification and Validation - Process model to represent different phases - Life cycle models.

UNIT-II BLACK BOX AND WHITE BOX TESTING

White box testing - Challenges - Static testing - Structural testing - Black box testing.

UNIT-III INTEGRATION, SYSTEM AND ACCEPTANCE TESTING

Integration testing - Types - Phase of testing - Scenario testing - Defect bash - System and Acceptance testing: Overview - Functional vs. Non-Functional testing - Functional system testing - Non-functional testing-Acceptance testing.

UNIT-IV PERFORMANCE AND REGRESSION TESTING

Introduction - Factors Governing - Methodology for Performance testing - Tools and Process for Performance Testing - Regression Testing - Types of Regression testing - How to do Regression Testing?

UNIT-V INTERNATIONALIZATION AND ADHOC TESTING

Introduction to Internationalization - Primer on Internationalization - Test phases for Internationalization testing - Enabling testing - Locale testing - Internationalization Validation- Fake language testing - Language testing - Localization testing - Tools used for Internationalization - Challenges and Issues - Overview of Ad Hoc testing - Buddy, Pair, Exploratory, Iterative, Agile and Extreme Testing - Defect Seeding.

TEXT BOOK:

1. Srinivasan Desikan, Gopaldaswamy Ramesh, “Software Testing: Principles and Practices”, Pearson Publications, 2006.

REFERENCES:

1. Renu Rajani, Pradeep Oak, “Software Testing- Effective Methods, Tools and Techniques”, Tata McGraw Hill, 2004.
2. Boris Beizer, “Software Testing Techniques”, Dream Tech Press, Second Edition, 2003.

(B) MOBILE COMPUTING

Objective: To impart good knowledge of wireless communication to students

UNIT I :WIRELESS COMMUNICATION FUNDAMENTALS

Cellular systems- Frequency Management and Channel Assignment- types of handoff and their characteristics, dropped call rates & their evaluation -MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks.

UNIT II :TELE COMMUNICATION NETWORKS & WIRELESS LAN

Telecommunication systems – GSM – GPRS - Satellite Networks ,Wireless LAN – IEEE 802.11 - Architecture – services – MAC – Physical layer – IEEE 802.11a -802.11b standards – HIPERLAN – Blue Tooth.

UNIT III: MOBILE NETWORK LAYER & TRANSPORT LAYER

Mobile IP – Dynamic Host Configuration Protocol - Routing – DSDV – DSR – Alternative Metrics. Traditional TCP, Mobile TCP

UNIT IV: APPLICATION LAYER

WAP Model- Mobile Location based services -WAP Gateway –WAP protocols – WAP user agent profile- caching model-wireless bearers for WAP - WML – WML Scripts

UNIT V: DATABASE ISSUES

Database Issues: Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

TEXT BOOKS:

1. Jochen Schiller, “Mobile Communications”, Second Edition, Pearson Education, 2003.
2. William Stallings, “Wireless Communications and Networks”, Pearson Education, 2002.

REFERENCE BOOKS:

1. KavehPahlavan, PrasanthKrishnamoorthy, “Principles of Wireless Networks”, PHI/Pearson Education, 2003.
2. UweHansmann, LotharMerk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Springer, 2003..

(C) MICROPROCESSORS AND ITS APPLICATIONS

Objective:

To learn the architecture, programming, interfacing and rudiments of system design of microprocessors.

Unit-I: 8085 MICROPROCESSOR AND ARCHITECTURE

Microprocessors - Memory - I/O Devices - Memory Mapped I/O - Pin diagram and internal architecture of 8085 - Registers, ALU, Control & Status Registers - Instruction and Machine Cycles. Interrupts

Unit II: PROGRAMMING THE 8085

Introduction to 8085 Assembly language programming - 8085 instructions - Programming techniques with Additional instructions - Counters and Time Delays - Stack and Subroutines - Code Conversions

Unit-III: 8086 MICROPROCESSOR AND ARCHITECTURE

Pin Details and Internal Architecture of 8086 - Register organization, Bus interface unit, Execution unit, Memory addressing, Memory segmentation. Operating modes - Hardware and Software interrupts - Addressing Modes.

Unit-IV: PROGRAMMING THE 8086

8086 Assembly Language Programming - Implementing Standard Program Structures - String - Procedure and Macros. Instruction Description and Assembler Directives

Unit-V: INTERFACING PERIPHERALS

8255 PPI , 8253/8254 PIT, 8237 DMAC, 8259 PIC, 8251 USART.

TEXT BOOK

1. Microprocessor Architecture, Programming and Applications with 8085, Ramesh S. Gaonkar, Penram International Publishing (India) Pvt. Ltd. 4th Ed. (for Units I,II and V)
2. Microprocessors and Interfacing, Douglas V. Hall, Tata McGraw Hill, 2nd Ed. (for Units III and IV)

REFERENCE BOOKS:

1. Assembly Language Programming the IBM PC ,Alan R. Miller, SubexInc, 1987.
2. Advanced Microprocessors and Peripherals, Ray A K ,Bhurchandi K M , TMH.

Elective III PAPER – 3

(A) Internet of Things

Objective: To prepare the student for better application of internet technology.

Unit – I IoT Introduction

Introduction to Internet of Things: Definition – Characteristics of IOT – Physical Design of IoT – Things in IoT – IoT Protocols – Logical Design of IoT – Iot Functional Blocks – IoT Communication Models – IoT Communication APIs – IoT Enabling Technologies

Unit – II Domain Specific IoT - 1

Domain Specific IoT – I : Smart Lighting – Smart Appliances – Intrusion Detection – Smoke / Gas Detection – Smart Parking – Smart Roads – Structural Health Monitoring – Surveillance – Emergency Response – Weather Monitoring –

Unit – III Domain Specific IoT II

Domain Specific IoT – II : Air Pollution Monitoring – Noise Pollution Monitoring – Forest Fire Detection – River Flood Detection – Smart Grids- Smart Vending Machines – Route Generation & Scheduling – Fleet Tracking – Shipment Monitoring –

Unit – IV Domain Specific IoT III

Domain Specific IoT – III: Remote Vehicle Diagnostics – Smart Irrigation - Green House Control – Machine Diagnosis & Prognosis – Indoor Air Quality Monitoring – Health & Fitness Monitoring – Wearable Electronics

Unit – V IoT and M2M

IoT And M2M: M2M – Difference Between Iot And M2M – SDN And NFV For IoT – IoT System Management With NETCONF – YANG : Need For Iot Systems Management – SNMP- Network Operator Requirements – NETCONF – YANG-IoT Systems Management With NETCONF - YANG

Text Books:

1. Interconnecting Smart Objects with IP: The Next Internet, Jean-Philippe Vasseur, Adam

Dunkels, Morgan Kuffmann.

Reference

1. Internet of Things, P.Rizwan Ahmed, Margham Publications, Chennai.
2. Designing the Internet of Things, Adrian McEwen (Author), Hakim Cassimally

(B) System Software

Objective: To make the student to become more proficient with system programming

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

(C) Multimedia Systems

Objective :

This course presents the Introduction to Multimedia, Images & Animation and enable the students to learn the concepts of Multimedia.

UNIT I Introduction to Multimedia:

Introduction to Multimedia PCs – Components of Multimedia – Multimedia Tools Sound and Graphics : Digital Sound – Editing and Mixing sound files – MIDI creation – Tracking Procedure – Interactive and Non Interactive Graphics – High Resolution Graphics – Difference between TV and Computer Display.

UNIT II Video and Animation:

Digital Image concepts – Video Capturing – Scanning Images – Digital Filters Morphing and Warping – Two Dimensional and Three dimensional animation – Animation Tools – Layering technique – Blue Screen technique – Latest movie technologies – Motion Tracking System – Motion Capturing System.

UNIT III Creating Presentation:

Script Writing and creating interactive and non-interactive presentation – Linear and Non Linear Editing – Authoring Tools – File Formates SOUND, VIDEO, ANIMATION, Presentation Images. Multimedia Programming: Text Links – Hyper Text system – Form Creation – File storing - Error Trapping.

UNIT IV Sound Links:

Multimedia interfaces – MCI- API- High Level Multimedia Functions – WAVE, MIDI file processing. Animation: Color Palette – Events – ROPs.

UNIT V Imaging Special Visual Effects:

Bitmap – Brushes – Dissolve –Hotspot Editor – Scrolling. Media Control Interface: Simple Commands – API functions – CD Player – Video Capturing – Form – AVI Play Form.

Text Books :

1. Kaliyaperumal Karthikeyan,“Introduction to Multimedia System”, LAP Lambert Academic Publishing, 2011
2. TayVaughan,“Multimedia Making It Work Eighth Edition”,Tata McGraw-Hill Publishing Company, 2011
3. ParagHavaldarand Gerald Medioni,“Multimedia Systems”, Cengage Learning, 2011
4. S. K. Bansal,“Multimedia Systems”,Aph Publishing Corporation, 2011

Skilled Based Subject IV

ASP .NET

UNIT I : ASP.NET Basics

Introduction to ASP.NET: .NET Framework (CLR, CLI, BCL), ASP.NET Basics, ASP.NET Page Structure, Page Life Cycle. Controls: HTML Server Controls, Web Server Controls, Web User Controls, Validation Controls, Custom Web Controls.

UNIT II: Form

Form validation: Client side validation, Server side validation, Validation Controls: Required Field Comparison Range, Calendar Control, Ad rotator Control, Internet Explorer Control. State Management: View State, Control State, Hidden Fields, Cookies, Query Strings, Application State, Session State.

UNIT III: ADO.NET

Architecture of ADO .NET, Connected and Disconnected Database, Create Database, Create connection Using ADO.NET Object model, Connection Class, Command Class, Data Adapter Class, Dataset Class, Display data on data bound controls and Data Grid.

UNIT IV: Database accessing

Database accessing on Web Applications: Data Binding Concept with web, Creating Data Grid, Binding standard web server controls, Display data on web form using Data Bound Controls.

UNIT V: XML

Writing Datasets to XML, Reading datasets with XML. WEB services: Remote method call using XML, SOAP, Web service description language, Building and Consuming a web service, Web Application deployment.

Textbook:

Professional ASP.NET 1.1 Bill Evjen , Devin Rader , Farhan Muhammad, Scott Hanselman , Srivakumar

REFERENCE BOOKS:

1. Introducing Microsoft ASP .NET 2.0 Esposito PHI
2. Professional ADO.NET BipinJoshi,Donny Mack, Doug Seven , Fabio Claudio Ferracchiati, Jan D NarkiewiczWrox
3. Special Edition Using ASP.NET Richard Leineker Person Education
4. The Complete Reference ASP.NET Matthew MacDonald TMH
5. ASP.NET Black Book Dream Tech